

CONTEXTUAL INFLUENCES ON DEPRESSED INTERPERSONAL BEHAVIOR

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Clinical theories converge in hypothesizing that depression is linked to reduced interpersonal agency, which often manifests in an increase in submissive behavior. There is mounting support for this hypothesis from studies using dispositional measures of interpersonal style. However, numerous questions remain about how depression influences actual interpersonal behavior both within and across real-life situations. In particular, relatively little is known about how situational context influences depressed individuals' interpersonal behavior.

The current studies used a “multi-tiered” approach to address this gap in the literature, combining dispositional, cross-situation (i.e., ambulatory assessment), and within-situation (i.e., observational) measures of interpersonal behavior. The interpersonal dimensions of agency (i.e., dominance–submissiveness) and communion (i.e., affiliation–separation) were examined across all tiers in a large sample of clinical and community participants.

Analyses revealed a more nuanced picture of depressed interpersonal behavior than a simple reduction in agency. When dispositional measures were examined, most depressed participants did endorse one of two submissive styles (i.e., submissive affiliation or submissive separation). However, a non-trivial proportion of depressed participants (e.g., those with “Cluster B” or dramatic/erratic personality traits) endorsed more dominant interpersonal styles. Thus, depression is often, but not always, linked to submissive dispositional traits.

Mean differences between depressed and non-depressed participants were also subtle when cross-situation and within-situation measures were examined. Depression was associated with more negative affect during interactions and more bias when interpreting romantic

partners' behavior in terms of agency. However, significant effects of depression on participants' overall agency and communion were not found. Rather, depressed participants were subject to most of the same interpersonal processes as non-depressed participants and differed only subtly in terms of perceptions and reactivity.

Depressed or not, participants tended to match with their interaction partners on communion and mismatch on agency. They found their interaction partners' separative behavior to be unpleasant and tended to respond to partners' negative affect with separative behavior. These results underscore the importance of understanding depressed behavior within its broader interpersonal and affective contexts. Depression may be related to a general decrease in interpersonal agency, but different situations can easily draw out different behaviors.

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1.0 INTRODUCTION

Connections between depression and interpersonal functioning are diverse and bidirectional. Research has found that stressful interpersonal events, loneliness, marital distress, and social skills deficits all serve as risk factors for depression [63, 71]. There is also evidence that, through their characteristics and behavior, individuals with—and at risk for—depression contribute to stressful interpersonal circumstances that may overwhelm their coping abilities and lead to vicious cycles of interpersonal stress and depression [62, 81].

Drawing from a variety of perspectives, clinical theories have attempted to describe and explain these bidirectional, interpersonal processes. In reviewing the literature, the current paper will argue that these theories show a great deal of convergence with one another. Moreover, it will argue that their convergent predictions have been consistently supported by research using dispositional measures of interpersonal functioning. However, it is still largely unknown how these processes play out across—and within—specific social situations. The current paper addresses this gap in the literature by examining the interpersonal behavior of a clinical sample at a global/dispositional level, across situations (using ambulatory assessment), and within situations (using observational measurement). Specifically, it will test the hypothesis that depressed interpersonal behavior is meaningfully influenced by contextual factors including the individual’s emotion, the type of partner he or she is interacting with, and his or her perceptions of that partner’s behavior.

1.1 THEORIES OF DEPRESSED INTERPERSONAL BEHAVIOR

Investigators from a wide range of theoretical orientations—from the psychoanalytic and cognitive-behavioral to the ethological and evolutionary—have converged on the same notion that depression is associated with two types of interpersonal problems: one related to dependency, submissiveness, and neediness and another related to autonomy, withdrawal, and self-criticism [23, 47]. Some theories describe these problems as distinct pathways to depression with any given individual falling into one or the other camp, while others hint at the possibility that the same individuals may endorse both positions at different times or in different contexts. In the following subsections, an overview of these theories will be provided as well as a brief review of the evidence for their validity in explaining aspects of depression. Afterward, the interpersonal circumplex will be described and offered as a lens through which to view and integrate these theories.

1.1.1 Psychodynamic perspectives

In an integration of psychoanalytic theory [1, 21, 43, 44, 76, 104] and cognitive-developmental psychology [96, 123], Blatt [22] proposed that vulnerability to depression is conferred by impairments in the development of mental representations of the self and others (i.e., object representations). He argued that, throughout an evolving developmental process, these representations become increasingly less literal and more symbolic. Higher levels of development allow important objects (e.g., parents and lovers) to be retained internally through stable, internalized representations and relinquished externally so that separations can be tolerated. Depression becomes more likely when this developmental process is arrested.

Furthermore, specific types of depression were argued to be characteristic of different levels of object representation [22]. When representations are at a relatively lower (i.e., sensorimotor) level, the individual is not able to relinquish the object externally and there is a constant need to maintain direct physical, sensory, and need-gratifying contact with it. This situation gives rise to *anacletic* depression, which is marked by primary feelings of helplessness, weakness, and depletion; intense wishes to be soothed and cared for; and dominant

fears of abandonment and being unloved. In contrast, when object representations are at a relatively higher (i.e., perceptual or iconic) level, the individual can relinquish the object externally but has not been able to retain it internally in a stable and integrated representation. Instead, the individual attempts to win the object's love by striving for excessive achievement through perfectionism or attempts to maintain contact with a fragmented and ambivalent internalized representation through self-criticism and guilt. This situation gives rise to *introjective* depression, which is marked by primary feelings of worthlessness, unlovability, and failure; exceedingly high ideals and self-scrutiny; and a proclivity to assume blame and personal responsibility.

Blatt and Shichman [24] expanded the previous model and shifted its emphasis from object representations to two parallel developmental lines: one leading to the establishment of satisfying, intimate interpersonal relationships and another leading to the establishment of a stable, realistic, and essentially positive self-identity. In this revised model, anaclitic depression was argued to be a distorted and exaggerated attempt to maintain satisfying interpersonal relationships, while introjective depression was argued to be a distorted and exaggerated attempt to establish an effective sense of self. Furthermore, because healthy development depends on a dialectic interaction between both relatedness and self-definition, dysfunction in one is likely to lead to dysfunction in the other as well. For example, in addition to encouraging achievement striving and self-criticism, introjective depression may cause an individual to neglect interpersonal experiences or to excessively focus on how such experiences inform his or her self-definition.

Blatt et al. [25] developed the Depressive Experiences Questionnaire to assess the everyday life experiences of individuals with depression. Consistent with the theories presented above, two problematic factors emerged: one termed *dependency* that captures issues regarding relatedness and another termed *self-criticism* that captures issues regarding self-definition. As reviewed by Blatt [23], there is substantial evidence of a link between these factors and depression. For example, in community samples, the dependency and self-criticism factors are positively correlated with traditional self-report measures of depression. In clinical samples, patients have higher dependency and self-criticism scores than nonpatients, and depressed inpatients score higher on dependency (but not self-criticism) than

general psychiatric inpatients.

1.1.2 Attachment perspectives

Drawing from ethological and object-relations theories, Bowlby [26] proposed that the nature of the emotional (i.e., attachment) bonds developed in early childhood determines the nature of subsequent interpersonal relationships as well as an individual’s vulnerability to psychopathology. Specifically, Bowlby [27] proposed that vulnerability to depression is derived from the early loss of attachment security, which may be caused by the death, neglect, or inconsistency of primary attachment figures. Such losses were thought to encourage the formation of negative (e.g., pessimistic and hopeless) mental models of the self and the world that can lead to depression when the individual encounters subsequent hardships.

Furthermore, Bowlby [27] proposed that specific kinds of childhood experiences are linked to specific types of mental models and patterns of depressive symptoms. First, a child who never attained a stable and secure relationship with caregivers despite repeated efforts to do so was thought to interpret subsequent losses as “yet another of his failures” (p. 247). Second, a child who was repeatedly told how unlovable or inadequate he is was thought to develop a negative model of himself and to expect others to be unavailable, rejecting, or punitive. Third, a child who experienced the actual loss of a caregiver was thought to develop the belief that he is impotent to change his situation. Bowlby [28] refined these predictions and incorporated Ainsworth et al.’s (1978) research on attachment patterns. He noted that a child with the *anxious-resistant* pattern, who is uncertain if a caregiver will be available and helpful when called upon, tends to be clinging, anxious, and reluctant to explore the world; whereas a child with the *avoidant* pattern, who believes that a caregiver is more likely to rebuff than to help him, tends to be compulsively self-reliant in an attempt to live without the love and support of others.

Bowlby’s ideas regarding depression have received strong support from empirical research. More than 200 studies have examined associations between attachment security and depression severity in both clinical and nonclinical samples. As reviewed by Mikulincer and Shaver [86], attachment insecurity has been consistently related to higher levels of depression

in cross-sectional studies and has longitudinally predicted increases in depressive symptoms over periods of time ranging from 1 month to 6 years.

Hazan and Shaver [65] conceptualized romantic love as an attachment process and translated the childhood attachment paradigm into terms directly relevant to adult relationships. Individual differences in adult attachment dynamics have been characterized in a two-dimensional space defined by the *attachment anxiety* and *attachment avoidance* dimensions [13, 56]. Whereas attachment anxiety reflects the degree to which an individual fears rejection and abandonment, attachment avoidance reflects the degree to which an individual feels discomfort with closeness and depending on others. As reviewed by Mikulincer and Shaver [86], attachment anxiety is more strongly associated with depression than is attachment avoidance. However, this difference is less evident when examining the relationship between attachment dimensions and specific depressive symptoms. For example, attachment anxiety has been related to over-dependence, lack of autonomy, and neediness, whereas attachment avoidance has been related to perfectionism, self-punishment, and self-criticism. Hankin et al. [64] found that both avoidant and anxious attachment predicted prospective increases in depressive symptoms over a 2-year period.

1.1.3 Cognitive perspectives

Beck [16] proposed that depression is largely driven by cognitive distortions including a negative view of the self, negative interpretations of ongoing experience, and a negative view of the future. Later, he noticed that the specific content of these distorted cognitions seemed to align with premorbid personality traits and organize into two major dimensions or clusters [17]. These clusters, in turn, seemed related to an individual's life stresses, presenting problems, and behavioral patterns.

One cluster of individuals was preoccupied with themes of deprivation, isolation, and abandonment. Their negative cognitions tended to focus on issues of social desirability (e.g., "I am unattractive/unlovable") and their symptoms were typically precipitated by the loss of a source of nurturance (e.g., rejection, separation, or grief). Beck [17] theorized that this form of depression is driven by excessive investment in positive interchange with other people,

which he termed *sociotropy*. He noted that the well-being of individuals high in sociotropy depends on social inputs (e.g., acceptance, guidance, and validation). He also noted that such individuals tend to seek help and reassurance from others and to avoid being directly assertive for fear of damaging needed relationships.

The other cluster of individuals was preoccupied with themes of defeat, entrapment, and failure. Their negative cognitions tended to focus on issues of competence (e.g., “I am inadequate/inept”) and their symptoms were typically precipitated by factors that interfere with goal-directed behavior (e.g., overwhelming demands, competition, or disability). Beck [17] theorized that this form of depression is driven by excessive investment in independent action and achievement, which he termed *autonomy*. He noted that the well-being of individuals high in autonomy depends on their ability to direct their own activities and to attain their goals without encroachment or strife. He also noted that such individuals tend to be less influenced by external feedback, less sensitive to others’ needs and wishes, and more prone to social withdrawal and displays of hostility.

Several self-report questionnaires have been developed to measure sociotropy and autonomy [11, 18, 32, 110]. Research in both clinical and nonclinical samples has found support for a positive association between depressive symptoms and sociotropy in particular [91]. However, the hypothesized specificity of precipitating factors (e.g., interpersonally-based for sociotropy and achievement-based for autonomy) has received mixed support; rather, both types of life stressors seem to be associated with increased risk of depression for individuals high in either sociotropy or autonomy [111].

1.1.4 Evolutionary perspectives

Gilbert [46, 47] proposed that there are two forms of vulnerability to depression: one involving insecurity in the attachment system and the other involving insecurity in the social rank system. In human phylogeny, the selective process that has had the greatest effect on changes in brain function and structure has been K-selection, a reproductive strategy characterized by high parental investment in a small number of slowly developing offspring [34]. This longer developmental window, and the increased dependency on learning that accompa-

nies it, affords greater behavioral flexibility to meet biosocial goals under conditions of keen intra-species competition. However, it also carries a great potential cost; if the environment fails to provide what is needed, then serious disturbances can result [83].

Evolved attachment mechanisms are crucial for K-selected species because they improve the likelihood that highly vulnerable offspring will receive parental investment. Attachment relationships are also key to the development of the threat defense and safety systems, which regulate affect, stress, and behavior [48]. Insecurity in attachment relationships are thus argued to confer vulnerability to depression through ineffective functioning in these regulatory systems. Put another way, early attachment experiences lead to the development of different strategies for maintaining attachment bonds, which influence individual's abilities to cope with stressors in adulthood [26]. In order to manage insecurity in the attachment system, individuals may develop strategies of attachment anxiety and/or attachment avoidance [13].

Evolved social rank mechanisms are also crucial for K-selected species (especially those that form social hierarchies). At some point in their development, offspring must “leave the nest” to seek out and compete for their own resources. However, competition is fraught with dangers as rivals may threaten, exclude, or attack one another. Price [101, 102] proposed that, in order to reduce the risk of injury or death, an evolved mechanism is triggered in losing competitors that de-escalates competitive conflicts. This de-escalation is achieved by promoting negative affect (e.g., hopelessness and apathy), flight/withdrawal, and submissive behavior on the one hand and by restricting positive affect, overt aggression, and acquisitive behavior on the other. Effectively, this mechanism encourages the loser to give up and to signal to others that he or she has done so. If these de-escalation strategies are too powerful or fail to terminate, the result may be the experience of clinical depression [116].

Empirical support for a connection between depression and the social rank system comes from a variety of sources. For example, dominant primates have blood serotonin levels significantly higher than subordinates, and this disparity is maintained by both the submissive signals of subordinates and the threat displays of dominants [106]. There is also evidence that subordinates in many stable primate groups, including humans, are more stressed than higher ranking animals and are at greater risk for depression [113, 128]. Finally, depressed people report seeing themselves as inferior or losers [16], feeling defeated [49], and withdraw-

ing or behaving submissively [7].

1.1.5 Social neuroscience perspectives

Social cognition is the ability to construct mental representations of the relations between oneself and others and to use those representations to guide social behavior; it involves skills such as emotion recognition, theory of mind, and empathy [2, 30]. The neural basis of social cognition involves a complex network of interacting brain areas [3]. Key regions include those involved in emotion regulation and higher-order processes (e.g., the ventromedial prefrontal cortex and dorsolateral prefrontal cortex), emotion appraisal and generation (e.g., the anterior cingulate cortex, amygdala, and ventral striatum), and perspective-taking and memory (e.g., the temporoparietal junction and temporal poles). Critically, many of these same regions show altered metabolic functioning or structural abnormalities in patients with mood disorders [100].

Studies examining facial emotion processing in acutely depressed patients point toward a processing bias involving enhanced attention to and recognition of negatively valenced expressions, as well as a tendency to amplify the amount of negative emotion conveyed by expressions [39]. Results from neuroimaging studies suggest that this negative bias reflects hypoactivity and reduced connectivity in brain areas such as the dorsolateral prefrontal cortex and dorsal anterior cingulate cortex, as well as hyperactivity and altered connectivity in brain areas such as the amygdala and ventromedial prefrontal cortex. There is also some evidence that these results are consistent across other social cognition tasks, such as theory of mind tasks and the recognition of emotion from speech prosody. Taken together, these results suggest that acute depression is marked by a lack of inhibition by higher-order cognitive structures on limbic and emotion-related structures [39].

Given the fundamental role that social cognition plays in shaping behavior, it is likely that depressed interpersonal behavior is influenced by these processing biases. Although social neuroscience does not make explicit predictions regarding depressed behavior, it provides a mechanism for how depression might contribute to the development and maintenance of interpersonal problems. By focusing on, and amplifying, negatively valenced social infor-

mation, depressed individuals are likely to confirm and compound any feelings of rejection, threat, and insecurity that they might experience. These negative feelings, and their impaired regulation, may then elicit maladaptive behavioral reactions.

1.2 THE INTERPERSONAL CIRCUMPLEX AND INTEGRATION

Although each of the aforementioned theories of depression uses its own language and has its own ideas about etiology and treatment, they all show a remarkable amount of convergence in terms of their predictions regarding interpersonal behavior. However, to fully appreciate this convergence, it would be helpful to gain an ecumenical perspective and a common vocabulary that can be shared across theories. In service of this goal, a brief overview of *interpersonal theory* will be provided and its circumplex model of interpersonal functioning will be argued to be exactly this kind of perspective and vocabulary.

Traditional interpersonal theories of personality and psychopathology [80, 118] and their contemporary derivatives [e.g., 19, 70, 74] provide a framework for the study of personality, psychopathology, and psychotherapy that has been integrated conceptually and empirically with diverse theories at various levels of analysis, including traits, motives, and behaviors [98]. This rich history of integration, as well as interpersonal theory’s parsimony and the statistical properties of its structural model of interpersonal functioning, make it an ideal framework for unifying perspectives on depressed interpersonal behavior.

Contemporary interpersonal theory hinges on the meta-concepts of *agency* and *communion* [126]. These meta-concepts provide a good first approximation of the variation in interpersonal meaning [70] and capture “strategies” (i.e., evolutionary mechanisms or cognitive-behavioral programs) for managing the unique challenges of sociality. The agency dimension captures variation in strategies for managing social rank, including various forms of dominance and submission, whereas the communion dimension captures variation in strategies for managing interpersonal distance, including various forms of affiliation and separation.

Empirical research into interpersonal traits, problems, sensitivities, values, strengths, and behaviors converge in suggesting that the structure of interpersonal meaning takes the

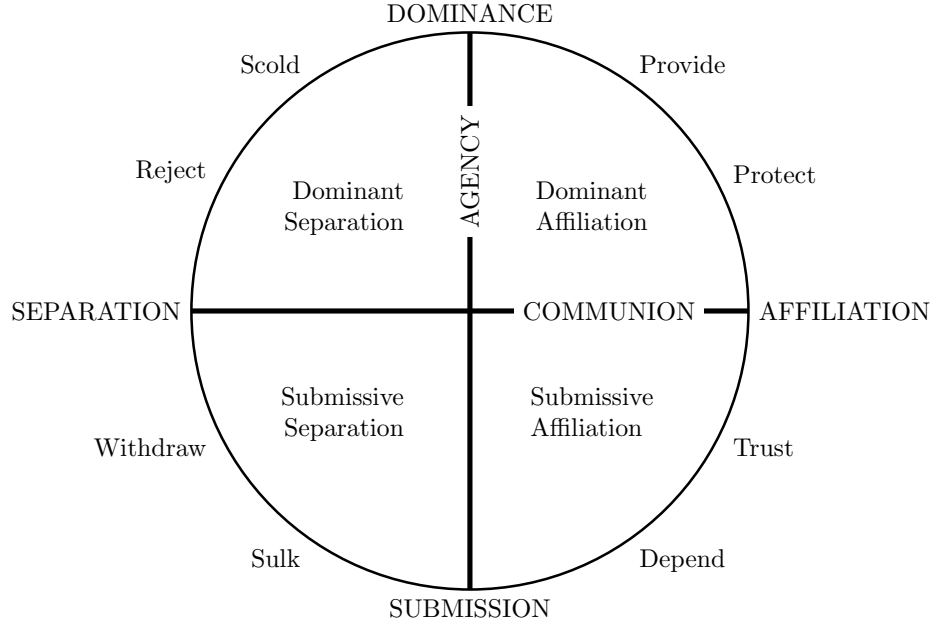


Figure 1: Depiction of the Interpersonal Circumplex (IPC) Model

form of a circumplex [98]. This circular structure, called the interpersonal circumplex (IPC), is formed by the intersection of the agency and communion dimensions (see Figure 1). The poles of each dimension represent relatively pure forms of dominance, submission, affiliation, and separation, while the full Cartesian space of the IPC is formed by blends of agency and communion. The geometric properties of the IPC are such that interpersonal qualities closest to one another in the circle are the most conceptually and statistically similar, while the qualities furthest apart are the least similar.

Viewed through the lens of the IPC, the aforementioned clinical theories converge in predicting that depression is marked by a reduction in interpersonal agency and either an increase or a decrease in interpersonal communion. That is, each theory views submissiveness to be a common feature of depression, with this sometimes manifesting as submissive affiliation (e.g., dependency, sociotropy, and attachment anxiety) and at other times manifesting as submissive separation (e.g., self-criticism, autonomy, and attachment avoidance). Numerous other theories of depression are also consistent with one or more aspects of this

prediction, including Arieti and Bemporad’s (1980) dominant-other (i.e., submissive affiliation) and dominant-goal (i.e., submissive separation) subtypes and Coyne’s (1976) model of excessive reassurance seeking (i.e., submissive affiliation).

However, important questions remain about how and when these behaviors occur. Are depressed individuals consistently submissive or is this response only elicited in certain situations? Are submissive affiliation and submissive separation distinct and consistent styles or do the same individuals fluctuate between them? What aspects of the social environment influence depressed interpersonal behavior, and what role does emotion play in this process? From an evolutionary perspective, Allen and Badcock [8] attempted to tackle some of these questions; they proposed that depression promotes behaviors that minimize social risk in different contexts. For example, competitive contexts should be met with submissiveness, while exchange-oriented contexts should be met with withdrawal, and allied contexts should be met with care-seeking. The social neuroscience literature, reviewed above, suggests that perceptions of others’ behavior will strongly influence depressed interpersonal behavior and that negative affect may mediate this relationship (e.g., perceived dominance elicits negative affect which promotes submission).

The following sections provide an overview of different approaches for studying interpersonal behavior, review the results and limitations of previous studies using these approaches, and propose a new set of studies and hypotheses to address these limitations.

1.3 APPROACHES TO STUDYING INTERPERSONAL BEHAVIOR

Empirical research on depressed interpersonal behavior has been conducted using a variety of related methods. These methods can be loosely grouped into three approaches: those using global *dispositional* reports, those using ambulatory *cross-situation* reports, and those using observational *within-situation* measurements. Each approach captures a different amount of behavioral detail and lends itself to a particular time scale; thus, each approach represents a trade-off between breadth and depth of measurement.

When using *dispositional* approaches, researchers collect global, retrospective reports

about participants' typical patterns of behavior across situations. Such approaches prioritize breadth of measurement over depth. Most clinical interviews and questionnaires adopt this approach. Its main weakness is that self-report and recall are both subject to a number of systematic biases [e.g., 29, 115]. Most concerning to the study of depression are the findings that the accessibility of memory content varies with participants' moods and mental states; that memory is influenced by what is known and believed in addition to what is recalled; and that salient, intense, and recent events tend to be disproportionately represented in recall. Dispositional assessments also tend to miss the context-specific nature of many experiences; for example, a global mean of interpersonal agency may be misleading when one type of situation is consistently met with dominance and another is consistently met with submission. However, there are also strengths to this approach. In addition to imposing a relatively small burden on participants and researchers, it measures participants' recollections as is (i.e., including any biases). Flawed as they may be, such measures are often better predictors of future behavior than measures that have been externally verified [e.g., 94, 108], presumably because participants treat these recollections as veridical.

When using *cross-situation* approaches, researchers collect repeated reports about participants' behavior during specific situations or in specific contexts. Such approaches represent a balance between breadth and depth of measurement. Most ambulatory assessment (e.g., experience sampling, event-contingent recording, and ecological momentary assessment) methods adopt this approach. These methods use paper questionnaires, smart phones, or other electronic devices that can be easily carried around by participants. Participants are then prompted to fill out surveys or provide other information at pre-selected intervals, time-points, and/or following specific types of events such as an interpersonal interaction or a change in symptoms [42, 115]. The main benefits of this approach are that it allows data to be collected in real-time, in real-world settings, and across a variety of situations. By focusing on current or recent experiences, the influence of retrospective memory biases is attenuated; by collecting data in real-world settings, the ecological validity of the data is increased; and by collecting information about multiple situations, measurement reliability is enhanced and context-specific relationships can be identified and examined. The main downsides of this approach are that it can impose a high burden on participants, that it often relies on self-

or informant-report which may be biased (even when applied in-the-moment), and that it may introduce or potentiate a number of practical complexities (e.g., data interdependency, missing data, technology issues, and compliance issues).

Finally, when using *within-situation* approaches, researchers collect measurements of participants' actual behavior during individual situations. Such approaches prioritize depth of measurement over breadth. Most nonverbal behavior and communication analysis studies adopt this approach. These methods use measurement instruments (e.g., coding schemes or rating scales) to operationalize and standardize the observational measurement of behavior; such instruments capture different aspects of behavior (e.g., its occurrence, frequency, or intensity) and vary in how abstract versus concrete their behavioral foci are [51]. The main benefits of this approach are that it circumvents many of the biases of self-/informant-report by collecting measurements from a trained third party (i.e., observer), provides nuanced detail about exactly how behaviors actually manifest, and allows for more control over (and even experimental manipulation of) the behavioral context. By assuming the onus of measurement themselves, observational researchers can assuage their concerns that participants may be poor reporters of their own behavior. The main downsides of this approach are that it can impose a high burden on researchers and that it often affords less ecological validity due to the constrained (e.g., laboratory) settings that behavior is typically observed in. That is, behavior observed in constrained settings may differ in systematic and important ways from participants' behavior in their everyday lives, which is often of primary interest.

1.4 PREVIOUS RESEARCH

1.4.1 Dispositional studies

Numerous studies have investigated the relationship between depressive vulnerability factors (e.g., self-criticism, sociotropy, and attachment avoidance) and dispositional measures of interpersonal functioning. These studies used the structural summary method [61] to locate measures and group differences within the IPC; it is described in detail in the Methods

section. The results of these studies support the conclusion that the aforementioned clinical theories converge on the notion that depression is associated with reduced interpersonal agency.

Using the Inventory of Interpersonal Problems [IIP; 6], several studies found evidence that dependency and sociotropy relate to interpersonal problems of submissive affiliation, while self-criticism and autonomy relate to interpersonal problems of separation [5, 41]. Pincus and Gurtman [99] found similar results for dependency and sociotropy using a factor analysis that combined multiple circumplex measures [i.e., 6, 37, 119], and Hmel and Pincus [67] found similar results for self-criticism and autonomy using the Interpersonal Adjective Scales [IAS; 127]. Finally, Sato and McCann [114] used modified forms of the IIP to compare interpersonal problems with close others and with non-close others. They found that sociotropy was related to submissive affiliation with non-close others and to dominance with close others, while autonomy was related to dominant separation with non-close others and to submissive separation with close others; these results support the notion that depressed interpersonal behavior is modulated by contextual factors.

Connections between attachment styles/dimensions and the interpersonal circumplex have proven more complex. There has been partial support for the predictions that attachment anxiety is linked to submissive affiliation and that attachment avoidance is linked to submissive separation. Using the IIP, Bartholomew and Horowitz [14] found that participants with dismissing-avoidant attachment styles (i.e., low anxiety and high avoidance) reported problems related to separation and that participants with fearful-avoidant attachment styles (i.e., high anxiety and high avoidance) reported problems related to submission. Similarly, using the IAS, Gallo et al. [45] found that attachment avoidance was related to submissive separation. However, contrary to these predictions, Bartholomew and Horowitz [14] also found that participants with preoccupied attachment styles (i.e., high anxiety and low avoidance) reported problems related to dominant affiliation, and Gallo et al. [45] found that attachment anxiety was related to submissive separation. More research is needed to fully understand the complex relationship between attachment processes and interpersonal problems.

Other studies compared the interpersonal functioning of depressed and non-depressed

groups. Five studies measured self-reported interpersonal problems using the IIP and six studies measured informant-reported interpersonal impacts using the Impact Message Inventory [IMI; 75]. Interpersonal impacts capture how informants (e.g., loved ones or therapists) feel when interacting with a participant; for example, a participant will score highly on submissive behavior if informants report feeling that they must “take charge” of interactions with him or her. Finally, one study used a special scoring procedure [120] for the NEO personality inventory [NEO-PI-R; 37] to generate interpersonal personality traits.

Studies comparing depressed samples to national norms using the IIP have consistently found that depression is associated with more interpersonal problems related to low agency (i.e., being socially avoidant, nonassertive, and easily exploited). Figure 2 depicts the central tendency of each depressed sample relative to national norms. The angular displacement of each point corresponds to its interpersonal “style,” while the distance of each point from the circle’s origin corresponds to its effect size.

Vittengl et al. [121] found that, while overall interpersonal problems decreased over the course of treatment, a sample with acute recurrent depression reported more problems related to a submissive style than national norms both before and after treatment. Barrett and Barber [12] found that subgroups with different comorbid diagnoses differed in terms of their interpersonal problems. Relative to depressed patients without these diagnoses, depressed patients with generalized anxiety disorder reported a more dominant style, while depressed patients with dependent personality disorder reported more a submissive and separate style. Grosse Holtforth et al. [58] found that the overall mean of a sample of depressed outpatients was near the submissive pole, although they noted a great deal of heterogeneity. Finally, Dinger et al. [41] found that a sample of depressed American outpatients with high self-criticism reported problems related a submissive and separate style and a sample of depressed German inpatients with high dependency reported a submissive style. Ravitz et al. [107] also administered the IIP to a depressed sample but did not compare their scores to national norms; they found that the sample reported a submissive and affiliative style.

Studies using the IMI to collect informant-reports of depressed samples’ interpersonal impacts have rarely standardized their results and, as such, most cannot be meaningfully depicted in Figure 2. Only Grosse Holtforth et al. [57] standardized their results on a large

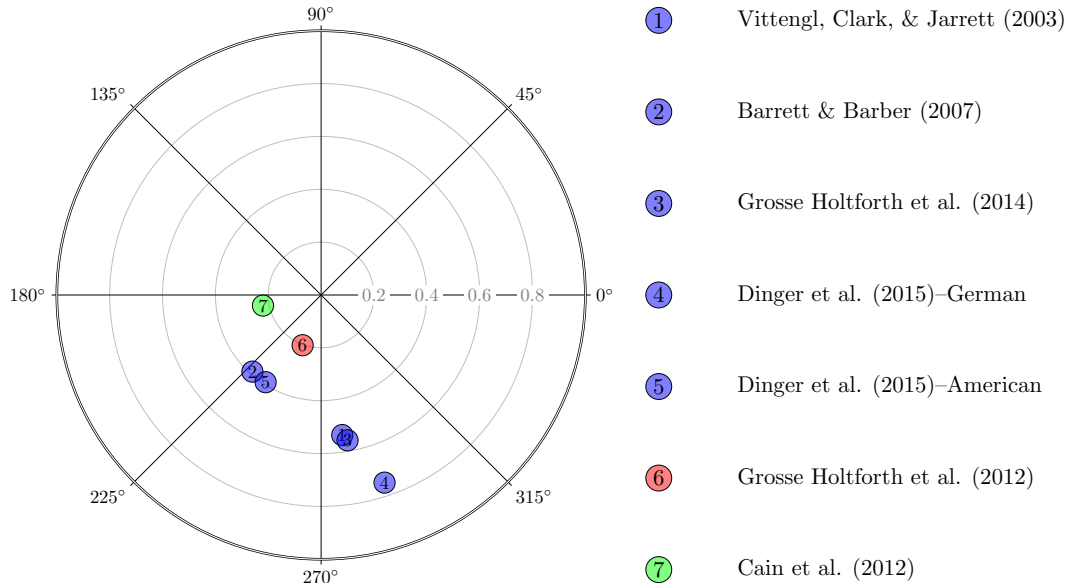


Figure 2: Interpersonal problems (blue), impacts (red), and traits (green) reported by depressed samples in previous studies using normalized dispositional measures

outpatient sample. They found that depressed outpatients had impacts associated with low agency and low communion; depressed outpatients' impacts also increased in both agency and communion over the course of treatment. Several other studies had the spouses of depressed participants fill out the IMI. Kahn et al. [72] found that depressed participants were experienced by their spouses as more submissive and separate than were nondepressed participants; Gotlib and Whiffen [53] found that couples with a depressed inpatient reported more dominance, more submissiveness, and more separation than control couples (averaged across reports of both partners' behavior); and McCabe and Gotlib [84] found that depressed participants were experienced by their husbands as slightly more dominant and considerably more separate than nondepressed participants. Finally, several studies had therapists complete the IMI regarding their depressed clients. Constantino et al. [35] found that low agency was related to depression in general, while low communion was related to chronic depression in particular; and Constantino et al. [36] found that a better therapeutic alliance was associated with a more affiliative interpersonal style.

Cain et al. [31] examined the interpersonal personality traits of participants with major depressive disorder using the NEO-PI-R. They found that the overall sample reported interpersonal traits related to low communion. However, they also found evidence of a great deal of heterogeneity with clusters of participants at various positions around the IPC. When comparing these clusters, it was found that participants who reported highly submissive personality traits had the worst outcomes (i.e., the most time depressed).

1.4.2 Cross-situation studies

To date, no studies have used cross-situation approaches informed by the IPC to examine interpersonal behavior in a sample with diagnosed, clinical depression. However, two studies used event-contingent recording to examine the relationship between depressive symptoms, vulnerability factors (i.e., self-criticism and dependency), and interpersonal behavior in community samples.

Zuroff et al. [132] had a community sample of participants fill out questionnaires after each social interaction (lasting at least 5 minutes) during a period of 20 days. Questionnaires captured positive and negative affect and the occurrence of interpersonal behaviors related to different areas of the IPC; the latter measures came from the Social Behavior Inventory [SBI; 68]. Participants also completed dispositional self-reports about their interpersonal traits and their levels of dependency and self-criticism. Correlations between dispositional interpersonal traits and situational interpersonal behavior were positive but modest (i.e., $r = .27$ for agency and $r = .26$ for communion), suggesting that these two approaches capture distinct information. When controlling for gender and self-criticism, dependency was related to less dispositional agency and more dispositional communion; it was not significantly related to any situational measures of interpersonal behavior. When controlling for gender and dependency, self-criticism was related to less dispositional communion, less situational agency, and less situational communion. It was also found that higher self-criticism attenuated the link between behaving in a dominant or affiliative manner on the one hand and feeling subsequent positive affect on the other.

In a similar design, Zuroff et al. [133] had a community sample of participants fill out

questionnaires after each social interaction for 20 days. Questionnaires captured participants' perceptions of inferiority and also included SBI questions about both the participants and their interaction partners. Across all interactions, higher depressive symptoms were associated with higher mean levels of perceived inferiority and lower behavioral agency. Higher depressive symptoms were also associated with a tendency to display submissive behavior both in response to perceived inferiority and in response to dominant behavior from one's partner. Partner dominance inhibited nonaffiliative behavior among participants with higher depressive symptoms, and partner affiliation was a weaker elicitor of affiliative behavior among participants with higher depressive symptoms. Thus, participants with higher depressive symptoms were more sensitive to partner dominance and less sensitive to partner affiliation, which suggests that depressed interpersonal behavior is influenced by perceptions of partner behavior.

1.4.3 Within-situation studies

Studies using within-situation approaches informed by the IPC to study depressed behavior have been rare. One study used the SBI to measure interpersonal behavior during a conflict discussion, and two studies used a coding system based on the Structural Analysis of Social Behavior [SASB; 20], which can be considered an alternate form of the IPC that distinguishes between behaviors that focus on others (e.g., blaming) and behaviors that focus on the self (e.g., sulking).

Mongrain et al. [87] used the SBI to examine the relationship between dependency, self-criticism, and interpersonal behavior in a community sample. Romantic couples were recruited in which the female partner had high or low scores on dependency and self-criticism. Couples engaged in a 10 minute conflict discussion and then filled out the SBI regarding their own and their partners' behavior; external judges (i.e., observers) also filled out the SBI for each participant. Judges perceived dependent women as more affiliative and perceived self-critical women as more separate or hostile. Dependent women rated themselves and their partners as more affiliative than judges did, and self-critical women rated themselves as more submissive than judges did.

Knobloch-Fedders et al. [77] used the SASB coding system to examine the behavior of distressed couples during positive interaction tasks. One group of couples included a member who had been diagnosed with a depressive disorder, while another group did not. Although the behavior of the depressed participants was not significantly different from that of the control participants, the partners of depressed participants did differ from the control participants. Specifically, the partners of depressed individuals showed more other-directed separation behavior (e.g., blaming, attacking, and ignoring) and more submissive behavior than did controls.

Knobloch-Fedders et al. [78] used the SASB coding system to examine the behavior of couples during conflict and problem-solving tasks. A number of the participants were diagnosed with a depressive disorder. To better answer their research questions, they grouped different SASB codes together into three behavioral clusters: demanding, withdrawing, and submitting. These clusters are located in the traditional IPC near the dominance, separation, and submission poles, respectively. Demanding behavior was positively associated with depressive symptoms for women, but negatively associated with depressive symptoms for men. It was also found that men diagnosed with depression were more likely to experience female-demand/male-withdraw sequences.

Despite the rarity of studies directly informed by the IPC, many studies have examined depressed interpersonal behavior from other perspectives. In reviewing this literature, I discovered that the behavioral codes of many common observational coding systems could be located within the IPC. After re-coding these behaviors as quadrants of the IPC, I performed a meta-analysis of the 11 studies that have observed depressed interpersonal behavior during marital interaction tasks [50]. With the caveat that some types of behavior (e.g., submissive affiliation) have rarely been measured, the results of this meta-analysis suggest that depression is associated with significant decreases in interpersonal agency and communion. The circular mean of the weighted average effect sizes was close to the midpoint of the submissive separation quadrant.

1.4.4 Summary

The majority of research on depressed interpersonal behavior has used dispositional measures. As shown in [Figure 2](#), the interpersonal problems reported by depressed samples are consistent with decreases in interpersonal agency and communion; sample means clustered around the submissive separation and submission octants. There is also some preliminary evidence that the interpersonal impacts and traits of depressed samples are associated with decreases in interpersonal agency and/or communion. Research using cross-situation measures have been rare. However, in community samples, depressive symptoms and vulnerability factors have been found to be related to lower behavioral agency overall; this pattern of submissiveness also appeared to be potentiated by partners' displays of dominance. Finally, research using within-situation measures have also been rare, although a meta-analysis of studies using coding systems indirectly related to the IPC found evidence of reduced interpersonal agency and communion in depressed samples. A small number of studies using each type of approach have also found evidence that depressed interpersonal behavior may be influenced by contextual factors, such as type of partner and perceptions of partner behavior.

1.5 THE CURRENT STUDIES

Clinical theories from a variety of different orientations converge in predicting that depression will be characterized by a reduction in interpersonal agency, which may manifest as submissive affiliation and/or as submissive separation. There is also mounting support for this prediction from studies using dispositional measures. However, given the limitations of dispositional approaches (e.g., recall/reporting biases and lack of contextual sensitivity), numerous questions about depressed interpersonal behavior remain. It is currently unclear if submissive affiliation and submissive separation are associated with distinct groups of depressed individuals or if depressed individuals vary in their displays of interpersonal communion across time or across situations. Aside from a few hints about heightened reactivity to partner dominance and different types of problems with different types of partners, very

little is known about how the stable and dynamic characteristics of social situations influence depressed behavior and contribute to interpersonal problems. It is also largely unknown how the well-documented biases in depressed individuals' social cognition influence their affect and behavior in interpersonal situations.

The current studies overcome many of the limitations of previous research by using dispositional, cross-situation, and within-situation approaches in tandem. The primary benefit of such a 'multi-tiered' approach is that it is capable of yielding a picture of depressed interpersonal behavior that is, at once, both broad and deep.

In service of this goal, a large sample of community and clinical participants was analyzed. This sample was originally collected to compare patients with personality disorders to members of relevant comparison groups (e.g., patients without personality disorders and untreated members of the community, with and without psychiatric diagnoses). Depression was well represented in this sample, but (by design) there was a higher rate of personality disorders than is found in the general population. This sample enables the current studies to examine how depression manifests in the context of personality pathology, which is common in patients suffering from more chronic and severe depressive illnesses and has important implications for treatment prognosis [97]. Furthermore, this sample enables the evaluation of the hypothesis that interpersonal behavior is jointly influenced by depressive and personality pathology. Additional data focused on understanding interpersonal functioning in the context of romantic relationships was also collected for a subset of the sample. Examining this context is critical because depression commonly co-occurs with marital distress, there is evidence that differences between depressed and non-depressed interpersonal behavior may be more apparent in this context than in other contexts, and depression is associated with negative outcomes for both marriages and non-depressed spouses [109]. Collecting data from both members of couples (with and without depressed members) also enables the comparison of members' behavior during and social perceptions of the same interactions.

Comparable methods were employed at each 'tier' of analysis through common reference to the interpersonal circumplex (IPC) model. At the dispositional tier, information was collected about psychiatric symptoms and diagnoses, as well as interpersonal problems. At the cross-situation tier, participants reported about all interpersonal interactions for three

weeks, including their behaviors, perceptions, and emotions. A subset of these interactions were between romantic partners and were reported on by both couple members. At the within-situation tier, couples engaged in a conflict discussion and perceptions of their behavior were reported by trained observers. This design enables hypotheses to be tested about how the influence of depression on interpersonal behavior is modulated by contextual factors, both within and across situations. It also allows mechanistic hypotheses to be tested about the role that emotion plays in translating social cognition into interpersonal behavior, and how this process might be disturbed in depression.

Although each of the current studies tested a unique set of hypotheses linked to its specific methods, there were several hypotheses about the influence of depression on interpersonal behavior that were examined in a more general sense. The first general hypothesis was that major depressive disorder would be associated with an overall reduction in interpersonal agency (regardless of how it was measured). The second general hypothesis was that interpersonal behavior related to both submissive affiliation and submissive separation would be associated with depression, either in separate subgroups of participants or in the same participants during different contexts. The final general hypothesis was that depression would potentiate participants' affective and behavioral reactivity to the interpersonal behavior of their interaction partners.

2.0 STUDY 1: DISPOSITIONAL

Study 1 examined the extent to which depression was associated with interpersonal functioning on a dispositional measure of interpersonal problems. This study explored several specific questions. First, do depressed participants tend to view themselves as more submissive (in general) than do non-depressed participants? Second, is depression associated with a single interpersonal style or are there subgroups of depressed participants with distinct styles? Finally, if distinct dispositional styles do exist, are they also associated with distinct demographic and psychodiagnostic characteristics? On the basis of theory and previous research, these questions can be concretized into specific hypotheses.

- **Hypothesis 1-1:** Major depressive disorder will be negatively associated with interpersonal agency as measured using the IIP-C and the structural summary method.
- **Hypothesis 1-2:** Subgroups of depressed participants will be distinguished by their interpersonal styles; specifically, one group will be associated with submissive affiliation and another group will be associated with submissive separation.
- **Hypothesis 1-3:** The subgroups of depressed participants described above will also differ in terms of demographic and psychodiagnostic characteristics. (Exploratory.)

2.1 METHODS

2.1.1 Participants

A total of 825 participants who completed diagnostic interviews and the IIP-C were drawn from five related subsamples (each corresponding to consecutive iterations of the same par-

Table 1: Demographic and methodological information about subsamples

Subsample	n	Age Mean (SD)	Female (%)	White (%)	DSM	Diagnosis Type
1. Validity	145	34.7 (9.3)	57.2	89.0	III-R	LEAD Consensus
2. Screening	146	38.9 (11.3)	68.5	87.0	IV	LEAD Consensus
3. IFB	138	37.9 (10.5)	76.1	73.9	IV	LEAD Consensus
4. EIFB	141	45.0 (10.4)	64.5	87.0	IV	LEAD Consensus
5. Couples	255	29.8 (7.1)	56.1	75.3	IV	Structured Interview
Overall	825	36.2 (10.9)	63.3	76.5		

ent grant, which focused on the assessment and longitudinal observation of psychiatric patients with personality disorders and members of relevant comparison groups, e.g., patients without personality disorders and untreated members of the community, with and without psychiatric diagnoses). The overall sample included a combination of both outpatient and community participants (63.3% female, 76.5% white, average age 36.2 years old). [Table 1](#) provides demographic and methodological information about each subsample. Psychiatric patients were recruited from outpatient clinics at Western Psychiatric Institute and Clinic, and community participants were recruited through advertising, telephone solicitation using random-digit dialing, and mailings to staff and faculty at the University of Pittsburgh. Potential participants were excluded if they had a lifetime history of a psychotic disorder or suffered from a medical condition that compromised the central nervous system. In the fifth subsample, bipolar disorder was also an exclusion criterion.

2.1.2 Measures

2.1.2.1 Inventory of Interpersonal Problems (IIP-C) The IIP-C [6, 69] is a self-report measure of interpersonal problems. It was designed to have circumplex properties, and its 64 items are assigned to eight octant subscales corresponding to points around the IPC model ([Figure 3](#)). Items correspond to interpersonal excesses (i.e., behaviors that “you do too much”) and inhibitions (i.e., behaviors that are “hard for you to do”). Each item is rated on a 5-point scale from “not at all” to “extremely.” As recommended by Gurtman [60],

subscale scores were standardized relative to a normative group using z-score transformations and population norms provided by Horowitz et al. [69]. Averaged across all subsamples, internal consistency (i.e., α) was .76 (domineering), .77 (vindictive), .83 (cold), .88 (socially avoidant), .90 (nonassertive), .83 (exploitable), .84 (overly nurturant), and .76 (intrusive).

2.1.2.2 Psychodiagnostic Assessment In the first four subsamples, participants were assigned diagnoses using the LEAD standard [117]. LEAD is an acronym for “Longitudinal, Expert, and All Data,” and it requires diagnosticians who have demonstrated their reliability to come to a consensus based on data from all available sources (including structured diagnostic interviews with participants, their own firsthand experiences, and collateral data from other informants such as significant others and other mental health professionals). Each case was presented at a diagnostic conference, where all available information was reviewed and discussed by at least three members of the research team until a consensus was developed regarding diagnoses. Participants in the first subsample were assessed using DSM-III-R criteria, whereas participants in all other subsamples were assessed using DSM-IV criteria. Consensus diagnoses were not yet available for the fifth subsample, so the diagnoses assigned by the primary clinician (following a structured interview) were used instead.

2.1.3 Data Analysis

2.1.3.1 Structural Summary Method To evaluate the nature of the interpersonal problems associated with major depressive disorder, the structural summary method (SSM) [59, 131] was used. This method was chosen over alternatives, such as interpreting correlations with individual subscales or collapsing octant scores into quadrant scores, because it provides a parsimonious account of the results while still preserving a great deal of information about different aspects of each profile. The SSM is based on the circular pattern of associations among variables comprising a circumplex inventory (e.g., the IIP-C subscales) and quantifies the extent to which correlations with an external variable (e.g., a diagnosis) conform to that same pattern. Specifically, the expected pattern of correlations should follow

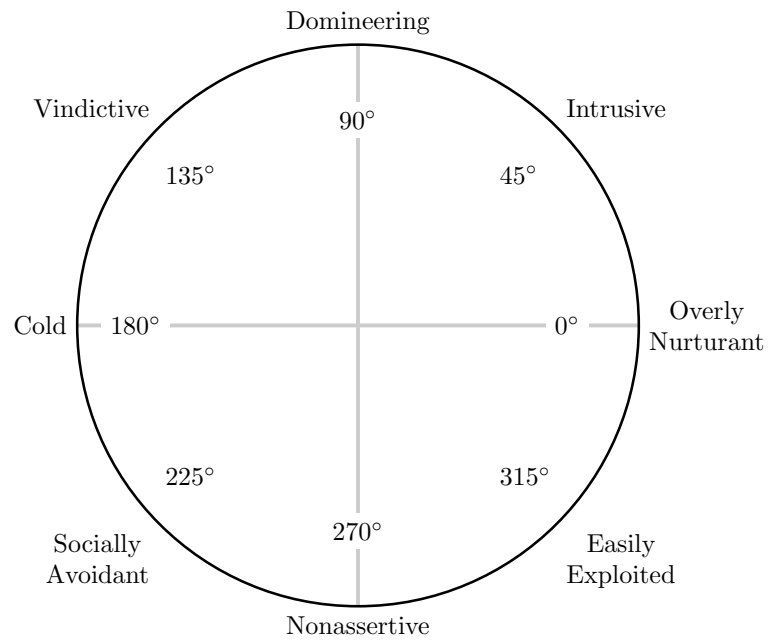


Figure 3: Diagram of the Inventory of Interpersonal Problems Circumplex Scales

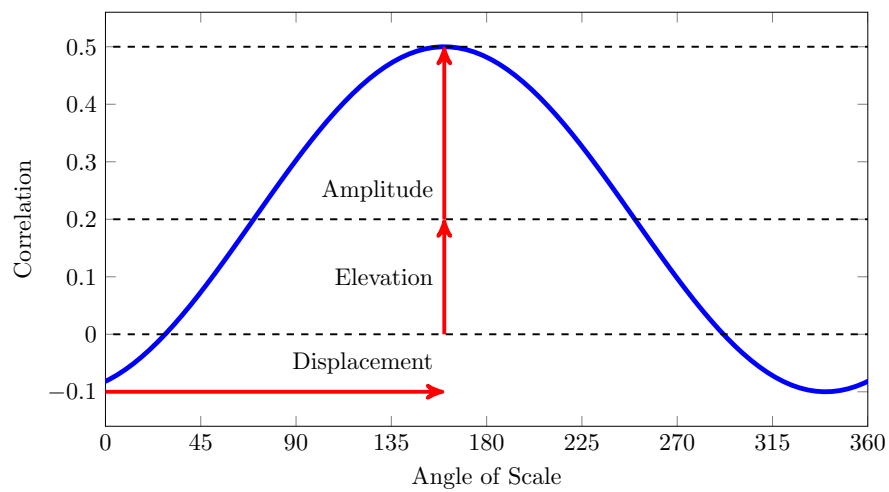


Figure 4: Diagram of the Structural Summary Method

a sinusoidal wave, which can be represented by the equation:

$$r_i^p = e + a(\cos(\theta_i - \delta)) \quad (2.1)$$

where r_i^p is a construct's predicted correlation with octant i , given that e is the elevation of the curve (i.e., the average correlation across all octants), a is the amplitude of the curve (i.e., the distance between the average correlation and the peak correlation), θ_i is the angle of octant i , and δ is the angular displacement of the peak of the curve from 0° (Figure 4). In this context, elevation can be interpreted as a profile's association with generalized interpersonal distress, amplitude can be interpreted as the distinctiveness of a profile, and angular displacement can be interpreted as the predominant interpersonal style of a profile [59]. Amplitude and angular displacement, but not elevation, are only interpretable when the observed profile has adequate prototypicality (i.e., goodness-of-fit, as quantified by R^2) [129].

SSM parameters were estimated in the current study using `ssm` version 0.1-1 [131], which uses resampling methods to derive confidence intervals. Following previous work in this area [130, 131], prototypicality scores of .70 or greater were interpreted as “adequate” and prototypicality scores of .80 or greater were interpreted as “good;” similarly, elevation and amplitude scores with absolute values less than .15 were interpreted as “modest” and those with absolute values of .15 or greater were interpreted as “marked.”

2.1.3.2 Latent Class Analysis To explore the possibility that the group of participants diagnosed with major depressive disorder was comprised of several subgroups with distinct interpersonal styles, latent class analysis (LCA) was used [93]. LCA is a form of finite mixture modeling that recovers discrete latent variables underlying categorical observed variables. It is commonly used to divide observations into mutually exclusive groups or “classes,” such that the observed variables are uncorrelated within each class. Instead of assuming that the variables follow any particular distribution within classes, LCA allows the variables to follow any distribution. The model for the latent class analysis can be represented as

$$\pi_{abcdefgh}^{ABCDEFGH} = \sum_x \pi_x^X \pi_a^{A|X} \pi_b^{B|X} \pi_c^{C|X} \pi_d^{D|X} \pi_e^{E|X} \pi_f^{F|X} \pi_g^{G|X} \pi_h^{H|X} \quad (2.2)$$

where X is the latent class variable, π_x^X is the size of class x , and, for example, $\pi_a^{A|X}$ is the probability that variable A (e.g., the participant’s score on the first subscale) takes on the value a in the latent class x . The multiplicative nature of this equation reflects the idea that, within classes, the variables are uncorrelated (i.e., conditionally independent).

In order to recover classes based on interpersonal style rather than degree of interpersonal distress, depressed participants’ scores on the IIP-C subscales were ipsatized (i.e., the mean of each participant’s subscales was subtracted from each of their subscales) prior to LCA ($N = 339$). Models were then fit for a successively increasing number of classes. The number of classes to retain was informed by a combination of the Bayesian Information Criterion (BIC), the Lo-Mendell-Rubin (LMR) likelihood ratio test, and theoretical considerations [92]. The number of individuals assigned to each class was also considered, given that extremely small classes lack utility. LCA was performed using Mplus version 8.0 [90].

Finally, in order to explore the classes recovered by LCA, several follow-up analyses were used. Structural summary parameters were calculated using the non-ipsatized IIP-C scores for participants in each class, and generalized linear models were used to compare the demographic and psychodiagnostic characteristics between classes. Logit link functions were used to predict binary characteristics (e.g., diagnoses) from categorical variables indicating class membership. Each generalized linear model was ran twice, each time with a different class as the reference group, in order to obtain all pairwise contrasts between classes. Generalized linear models were estimated using the `glm` function in R version 3.4.0 [103].

2.2 RESULTS

Biserial correlations between major depression and the IIP-C subscales ranged from .21 for domineering problems to .39 for both nonassertive and overly nurturant problems. When examined using the SSM, major depressive disorder had adequate prototypicality ($R^2 = .71$) and a nonassertive style ($\delta = 256.6$, 95% CI: [219.0, 289.8]); its profile was only modestly distinctive ($a = .06$, [.03, .10]) but was markedly elevated ($e = .27$, [.23, .32]). When projected into the IPC, this profile was associated with a significant reduction in agency ($-.06$,

$[-.10, -.02]$) and was not significantly associated with communion ($-.02, [-.05, .02]$).

Given that the prototypicality and distinctiveness of the depressed diagnostic group were rather low, this group may contain interpersonally distinct subgroupings. LCA models were fit for up to eight classes. The BIC fit index suggested that a seven-class solution had the best fit, whereas the LMR test suggested that including more than three classes would not significantly improve model fit (Table 2). In line with the LMR test, the three-class model was also the most interpretable. Models with more classes all included a minority class that was quite small in relative size (e.g., less than 3% of the depressed sample). Thus, the three-class model was retained for further analysis.

As shown in Figure 5, the three classes of depressed participants identified by LCA had quite different interpersonal styles. The first class included 113 participants (33% of the depressed sample). It had good prototypicality ($R^2 = .97$) and an exploitable interpersonal style ($\delta = 296.2$); its profile was markedly distinctive ($a = .52$) and markedly elevated ($e = .55$). The second class included 77 participants (23% of the depressed sample). It had good prototypicality ($R^2 = .91$) and a socially avoidant interpersonal style ($\delta = 222.8$); its profile was markedly distinctive ($a = .43$) and markedly elevated ($e = .44$). The third and final class included 149 participants (44% of the depressed sample). It had adequate prototypicality ($R^2 = .78$) and a domineering interpersonal style ($\delta = 75.3$); its profile was only modestly distinctive ($a = .10$) but was markedly elevated ($e = .35$).

As shown in Table 3, the three classes of depressed participants differed in terms of several demographic and psychodiagnostic characteristics. Participants in the first class were more likely to be white than were participants in either of the other classes; they were also more likely to be diagnosed with panic disorder and generalized anxiety disorder than were participants in the third class. Participants in the second class were more likely to be male than were participants in either of the other classes. Finally, participants in the third class were less likely to be diagnosed with dysthymia, social phobia, avoidant personality disorder, or dependent personality disorder, and were more likely to be diagnosed with antisocial personality disorder than were participants in either of the other classes.

Table 2: Comparison of the latent class analysis models

Classes	Log-likelihood	BIC	Entropy	LMR
1	−3453.77	7000.76	N/A	N/A
2	−3244.10	6633.85	.801	.004
3	−3161.48	6521.04	.785	.011
4	−3075.07	6400.65	.817	.339
5	−3018.41	6339.78	.834	.155
6	−2976.39	6308.16	.855	.606
7	−2941.73	6291.27	.844	.625
8	−2917.96	6296.17	.853	.999

2.3 DISCUSSION

Hypothesis 1-1 was that major depressive disorder would be associated with a reduction in interpersonal agency on a dispositional measure of interpersonal problems. This hypothesis was supported by the results in that the mean interpersonal problem profile of the depressed group was negatively associated with agency. Depressed participants endorsed marked interpersonal distress in general, and reported (on average) a nonassertive interpersonal style. This finding supports the idea that depression is associated with submissiveness and is consistent with previous research. However, this mean interpersonal problem profile had relatively low prototypicality (i.e., .71 is near the cutoff of .70) and its nonassertive interpersonal style was only modestly distinctive. These results suggests that there may be interpersonal heterogeneity (e.g., distinct subgroups) within the overall depressed group.

Hypothesis 1-2 was that there would be subgroups of depressed participants with different interpersonal styles: one with an exploitable style (i.e., submissive affiliation) and another with a socially avoidant style (i.e., submissive separation). This hypothesis was supported by the results in that LCA recovered one class with an exploitable style and another class with a socially avoidant style. Furthermore, these classes comprised more than half (56%) of the depressed group and showed good prototypicality and marked distinctiveness. These findings align with the clinical theories described above and suggest that submissive affiliation and submissive separation are distinct styles adopted by different individuals. However, a third

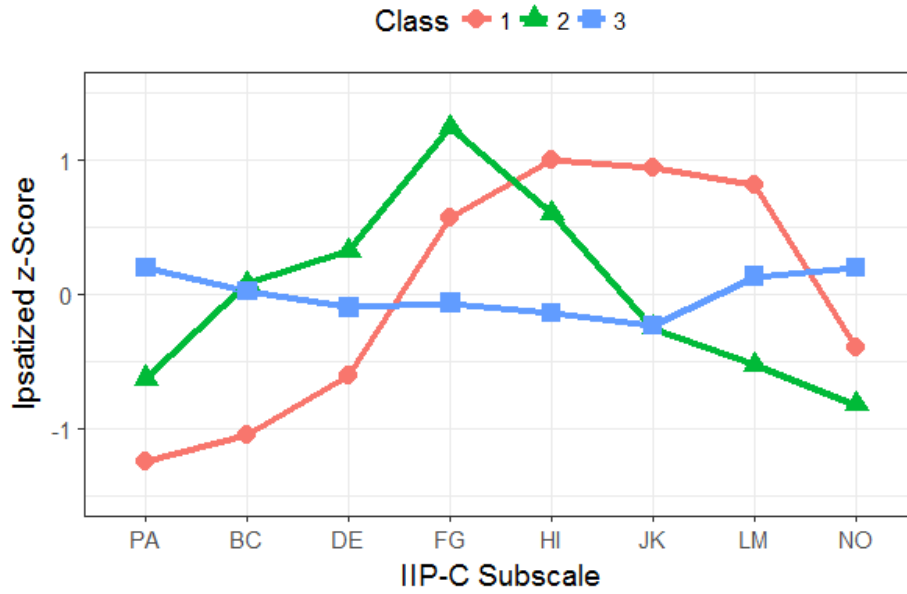


Figure 5: Estimated means of the IIP-C subscales for each class of the LCA solution

class with unexpected features comprised the remainder of the depressed group (44%). This class, like the other two, reported marked generalized interpersonal distress. However, unlike the others, this class reported a domineering (i.e., dominant) interpersonal style. At face value, this finding appears to run directly contrary to hypothesis 1-1, but it is important to note that this class's profile was only adequately prototypical and modestly distinctive. These findings suggest that this class was interpersonally heterogeneous (i.e., likely contained further subgroups) and was not as strongly or rigidly characterized by its mean interpersonal style as were the other two classes.

Hypothesis 1-3, which was exploratory, was that the depressed subgroups would differ in terms of demographic and psychodiagnostic characteristics (in addition to interpersonal problems). Comparison of the first two classes' characteristics revealed that the exploitable participants were more likely to be white, whereas the socially avoidant participants were more likely to be male. This latter finding is consistent with theories and findings suggesting that males are more likely to develop forms of depression marked by submissive separation

(e.g., autonomy and self-criticism) whereas females are more likely to develop those marked by submissive affiliation (e.g., sociotropy and dependency) [17, 33]. These two classes did not significantly differ in terms of any common syndromal or personality disorders.

On the other hand, the third class was quite different from the other two in terms of its psychodiagnostic characteristics. Participants in this third class were more likely to be diagnosed with antisocial personality disorder and were less likely to be diagnosed with dysthymia, social phobia, avoidant personality disorder, and dependent personality disorder. In other words, these participants were less likely to have “Cluster C” (i.e., anxious, fearful) personality traits that are frequently associated with depression and more likely to have “Cluster B” (i.e., dramatic, erratic) personality traits [97]. Thus, the large size of this subgroup is likely a result of the current sample’s focus on recruiting participants with Cluster B personality disorders. Despite being unexpected, the emergence of this class affords the opportunity to study less prototypical presentations of depression.

In conclusion, while all depressed participants reported a great deal of generalized interpersonal distress, depression was actually associated with several distinct interpersonal styles. In line with research hypotheses, slightly more than half of the depressed participants showed one of two submissive styles (i.e., exploitable or socially avoidant). The remainder of the depressed participants showed a more mixed style that was more dominant on average. These findings are consistent with the notion of “pathoplasticity” [125], i.e., that an individuals’ personality traits influence the expression of their symptoms.

Table 3: Comparison of classes identified using latent class analysis

	Prevalence in Class (%)			Class Contrast (p -value)		
	Class 1	Class 2	Class 3	(1 vs. 2)	(1 vs. 3)	(2 vs. 3)
Female	.81 ^a	.57 ^b	.77 ^a	.001	.435	.003
White	.88 ^a	.73 ^b	.64 ^b	.034	.001	.294
Alcohol Disorder	.10	.16	.18	.229	.060	.633
Drug Disorder	.08	.08	.14	.965	.127	.172
Dysthymia	.18 ^a	.13 ^a	.04 ^b	.384	.001	.018
Generalized Anxiety	.19 ^a	.16 ^{ab}	.09 ^b	.494	.021	.171
Panic Disorder	.26 ^a	.14 ^{ab}	.13 ^b	.082	.013	.748
Posttraumatic Stress	.12	.10	.11	.810	.845	.936
Social Phobia	.17 ^a	.18 ^a	.07 ^b	.807	.021	.017
Antisocial Personality	.03 ^a	.05 ^a	.17 ^b	.370	.001	.015
Avoidant Personality	.38 ^a	.51 ^a	.13 ^b	.086	.001	.001
Borderline Personality	.32	.40	.38	.235	.284	.770
Dependent Personality	.18 ^a	.14 ^a	.06 ^b	.533	.004	.044
Histrionic Personality	.11	.09	.13	.730	.493	.344
Narcissistic Personality	.11	.13	.16	.617	.204	.535
Obs.-Comp. Personality	.19	.14	.15	.438	.409	.923
Paranoid Personality	.05	.08	.11	.492	.091	.397

Note. $N = 339$. Numbers that do not share a superscript are significantly different across classes.

3.0 STUDY 2: CROSS-SITUATION

Study 2 examined the extent to which depression was associated with interpersonal functioning using a cross-situation measure of interpersonal perceptions. Interactions were analyzed separately based on if they were with romantic or non-romantic partners; interactions with romantic partners were reported on by both interactants. This study explored several specific questions. First, was participants' interpersonal behavior associated with their perceptions of their partners' behavior? Second, what role did negative affect play in this relationship? Third, did depression moderate aspects of these relationships? Finally, was depression associated with an increase or decrease in the similarity between outpatients' and romantic partners' perceptions of the same interactions? On the basis of theory and previous research, these questions can be concretized into specific hypotheses.

- **Hypothesis 2-1:** Participants' interpersonal behavior (i.e., self-perception) will be associated with their perception of their partners' behavior. Specifically, this association will be positive for affiliation and negative for dominance.
- **Hypothesis 2-2:** Participants' negative affect will mediate the association between self-perceptions and other-perceptions such that partner separation (or dominance) will be associated with negative affect and self-perceptions of separation (or submission).
- **Hypothesis 2-3:** Depression will be associated with greater submission and negative affect overall, a stronger link between perceptions of partner separation or dominance on the one hand and negative affect on the other, and a stronger link between negative affect and self-perceptions of submission.
- **Hypothesis 2-4:** Depression will be associated with greater bias in interpersonal perceptions. Specifically, depression will be associated with a tendency to perceive partners

as more dominant and less affiliative than those partners view themselves.

3.1 METHODS

3.1.1 Participants and Procedures

The data examined in Study 2 were drawn from a parent study that was designed to investigate the role of personality disorders in the functioning of romantic couples. (This same parent study also contributed data to Study 1’s fifth subsample.) Couples were eligible to participate in the parent study if the length of their relationship was one month or longer and if partners had regular contact with one another. Participants reflected a spectrum that ranged from a positive screen for a personality disorder to few or no symptoms of personality disorder. Many participants in the sample also reported depressive symptoms. Participants were excluded if they met criteria for a lifetime diagnosis of bipolar disorder or psychosis.

Participants engaged in an ecological momentary assessment (EMA) protocol over the course of three weeks. Using a study-provided smart phone, participants completed assessments in response to random prompts and after each interpersonal interaction lasting at least 10 minutes. Participants were also linked with their romantic partner such that, if a participant reported an interaction with their partner, their partner would then be prompted to complete a “yoked” assessment. These assessments collected information about participants’ positive and negative affect, setting and situation, and interpersonal behavior. During the three week period of the EMA protocol, participants came to the lab weekly to receive payment and to resolve any compliance issues. Participants were instructed to report each interpersonal interaction lasting at least 10 minutes. Information was collected regarding the situation and setting of the interaction (e.g., who it was with, where it occurred, and how long it lasted). Information was also collected about the topic or content of the interaction; different options were provided depending on whether the interaction was with the romantic partner or with someone else [95].

Although the parent study included a total of 258 participants (i.e., 129 couples), not all

participants provided the necessary data for inclusion in Study 2. Participants were excluded for the following reasons: had missing demographic and psychodiagnostic data ($n = 2$), did not provide any EMA reports ($n = 6$), did not provide EMA reports about interpersonal interactions ($n = 42$), and started but did not complete any reports about interpersonal interactions ($n = 3$). The maximum possible sample size for this data in Study 2 was thus 205 participants (i.e., 102.5 couples).

For the analysis of interactions with non-romantic partners, a total of 199 participants were included. These participants were mostly female (56%), white (74%), and in their twenties or thirties ($M = 29.4$, $SD = 6.8$). Fifty-six of them (28%) were diagnosed with major depressive disorder. A total of 4804 interactions with non-romantic partners were reported, for an average of 24 interactions per participant over the three week assessment period. In order to remove the potential for external influences, interactions in which other people were present were excluded. Interactions that took place over email or text-messaging were also excluded. Most interactions occurred with family members (26%), friends (24%), or coworkers (20%); they tended to take place at work (31%) or at home (29%), and tended to focus on common interests and memories (42%) or on recent experiences and accomplishments (31%). Finally, these interactions tended to last around an hour, although there was considerable variability in duration ($M = 62.2$ min, $SD = 116.8$).

For the analysis of interactions between outpatients and their romantic partners, a total of 174 participants (i.e., 87 couples) were included. The majority of couples were in cohabiting relationships (74%) and the average relationship length was 58.2 months ($SD = 50.3$). The majority of couples (87%) were in an opposite-sex relationship, while the rest were in a same-sex relationship. Outpatients were mostly female (78%), white (77%), and in their twenties or thirties ($M = 29.2$, $SD = 6.2$); forty-one of them (47%) were diagnosed with major depressive disorder. Partners were mostly male (70%), white (79%), and in their twenties or thirties ($M = 29.9$, $SD = 7.4$); eight of them (9%) were diagnosed with major depressive disorder. A substantial portion of participants (41%) reported an annual household income of less than \$25,000. A total of 960 interactions were reported on by both outpatients and partners, for an average of 11 interactions per dyad over the three week assessment period. Interactions in which other people were present or that took place over

email or text-messaging were excluded. Most interactions occurred at home (80%) with the remainder occurring outside (9%), at a bar or restaurant (3%), at work (2%), or at some other public place (6%). The most common conversation topics were leisure (39%), work (28%), habits (19%), money (19%), and chores (18%); note that an interaction could (and often did) cover multiple topics. Finally, these interactions tended to last around an hour, although there was considerable variability in duration ($M = 56.5$ min, $SD = 71.7$).

3.1.2 Measures

3.1.2.1 Social Behavior Inventory (SBI) Participants’ interpersonal behavior during each interaction was assessed using four rotating forms derived from the SBI [88]. Each form included a total of 16 items with 4 items designed to capture behaviors from each pole of the IPC (i.e., dominance, submission, affiliation, and separation). Items were dichotomous check boxes that were combined to form dimensional dominance and affiliation scores (rescaled to the range of -1 to 1). Forms were presented in four-day cycles to prevent the adoption of response sets. A shorter form of 7 items also assessed participants’ perceptions of their interaction partners’ behavior (be that a romantic or non-romantic partner).

3.1.2.2 Positive and Negative Affect Scale (PANAS-X) Participants’ emotion during each interaction was assessed using 21 negative affect items and 10 positive affect items from the PANAS-X [122]. Each item was scored on a five-point scale from “very slightly or not at all” to “extremely” (rescaled to the range of 0 to 4). Example negative affect items included afraid, ashamed, angry, sad, and lonely, while example positive affect items included enthusiastic, excited, inspired, proud, and strong.

3.1.3 Data Analysis

Multilevel structural equation modeling (MSEM) [66, 89] is a flexible analytical framework that integrates multilevel modeling’s ability to accommodate nested data structures (e.g., multiple observations per individual) and the estimation of random effects (e.g., intercepts and slopes that vary across individuals) with structural equation modeling’s ability to es-

estimate complex associations among multivariate outcomes (e.g., complex mediation models and latent variable models). In addition, MSEM can be used to decompose the variance of observed variables into latent Level 2 (e.g., between-individual) variance and residual Level 1 (e.g., within-individual) variance. This approach to modeling guards against bias in Level 2 parameters when the number of observations differs across individuals [82]. MSEM models were estimated using Mplus version 8.0 [90].

To analyze participants' interactions with non-romantic partners, multilevel moderated mediation models [15] were used. Because interactions were not with one another, outpatients and their romantic partners were both included as participants and were not distinguished in these analyses. The variance in observed EMA variables (i.e., participants' reports of their interaction partner's interpersonal behavior, their own negative affect, and their own interpersonal behavior) was decomposed into between-person and within-person variance. In the within-person portion of the model, momentary mediation of partner-perception by negative affect was tested by regressing self-perception on partner-perception and negative affect, as well as by regressing negative affect on partner-perception. A random slope was estimated for each of these regression pathways. In the between-person portion of the model, the mediation model was recreated using the intercepts of each observed EMA variable. Indirect effects were estimated for both the within-person and between-person mediation pathways. Additionally, these intercepts and the random slopes from the within-person model were all regressed on the participant's depression status. Figure 6 depicts the general model (note that, in all included MSEM figures, covariances are omitted for clarity of presentation). Separate models were estimated for perceptions of interpersonal affiliation and dominance.

To analyze interactions between outpatients and their romantic partners, multilevel actor-partner interdependence models (APIM) [73] in the MSEM framework were used. Specifically, the *truth and bias model* [124] was used as a conceptual and statistical framework for analyzing the "yoked" EMA reports of interactions by both outpatients and partners. In this model, an individual's perception of their interaction partner is influenced both by the partner's self-perception, which is conceptualized as "accuracy," and by the individual's own self-perception, which is conceptualized as "bias." The model thus attempts to test the degree to which individuals' social perceptions are biased by irrelevant factors, such as their own

behavior. The variance in observed EMA variables (i.e., outpatients' self-perceptions, partners' self-perceptions, outpatients' other-perceptions, and partners' other-perceptions) was decomposed into between-dyad and within-dyad variance. In the within-dyad portion of the model, accuracy and bias parameters for each person in the dyad were estimated as random slopes on regression pathways from self-perceptions to other-perceptions. In the between-dyad portion of the model, each person's EMA intercepts and random slopes were regressed on that person's depression status. [Figure 7](#) depicts the general model. Separate models were estimated for perceptions of interpersonal affiliation and dominance. All perception variables in each model were centered by subtracting the mean of all self-perceptions (i.e., across outpatients and partners) on either affiliation or dominance. With such a centering strategy, the directional bias indicates how much more positive or negative other-perceptions are from the average self-perception in the sample.

3.2 RESULTS

3.2.1 Interactions with Non-Romantic Partners

[Table 4](#) shows the results from the multilevel moderated mediation models of interactions between participants and non-romantic partners. In Model 1, which examined perceptions of interpersonal affiliation, there were significant random slopes for all three within-person regression pathways. There was a negative association between other-perceptions and negative affect, a negative association between negative affect and self-perceptions, and a positive association between other-perceptions and self-perceptions (all $p < .001$). The within-person indirect effect was also significant in this model ($p < .001$), suggesting that negative affect partially mediated the association between other-perceptions and self-perceptions of affiliation. On the between-person level, only the positive association between other-perceptions and self-perceptions was significant ($p = .009$). Finally, participants' depression status did not moderate any of the random slopes in Model 1, but was associated with a significantly higher intercept for negative affect ($p = .001$).

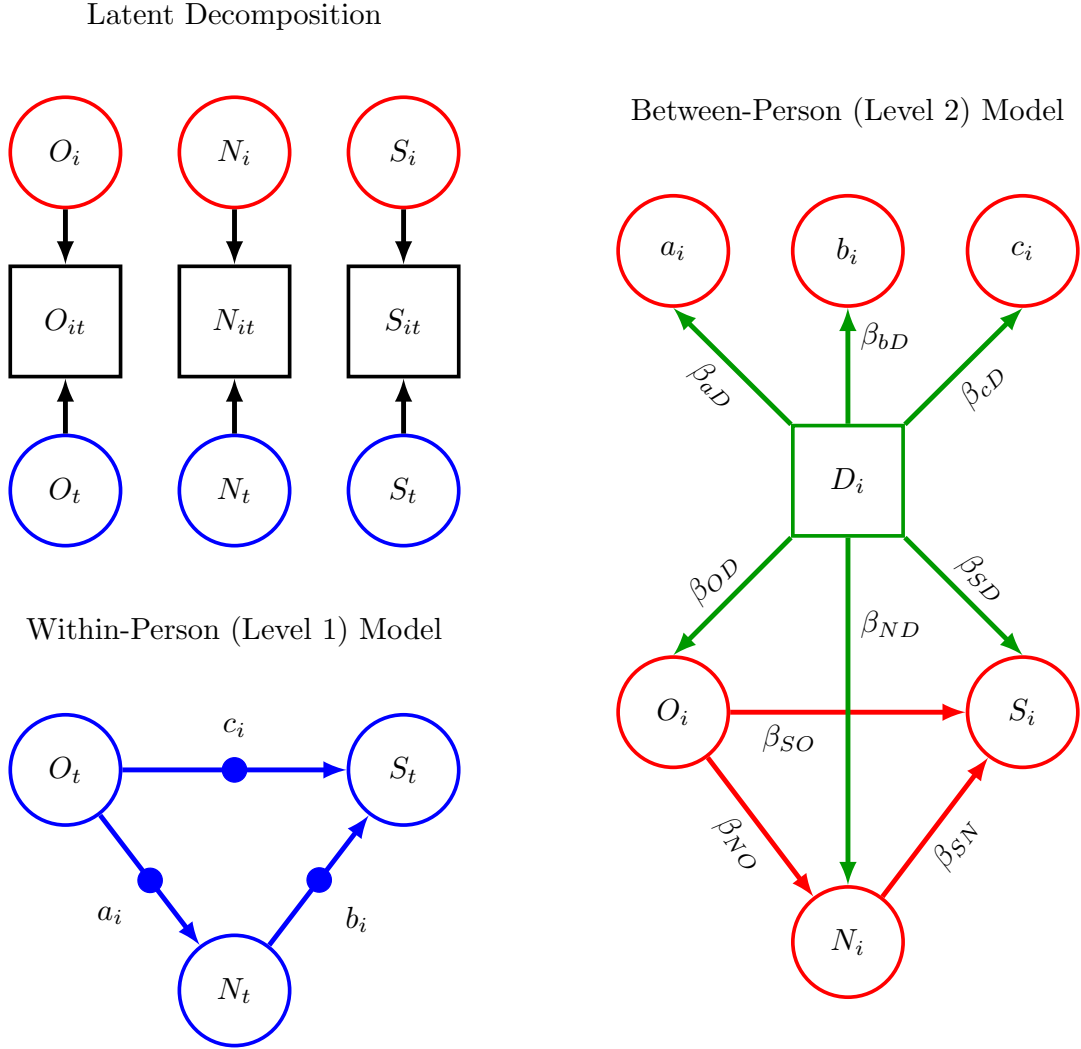


Figure 6: Moderated mediation model for interactions with non-romantic partners. The top-left panel depicts the latent decomposition of observed variables into within-person (t) and between-person (i) variance, the bottom-left panel depicts the within-person portion of the model, and the right panel depicts the between-person portion of the model. Filled dots represent random slopes on within-person regression paths and are labelled using mediation convention (i.e., a , b , and c). In this figure, O = participants' other-perception of their partners' behavior, N = participants' self-reported negative affect, S = participants' self-perception of their own behavior, and D = participants' depression status.

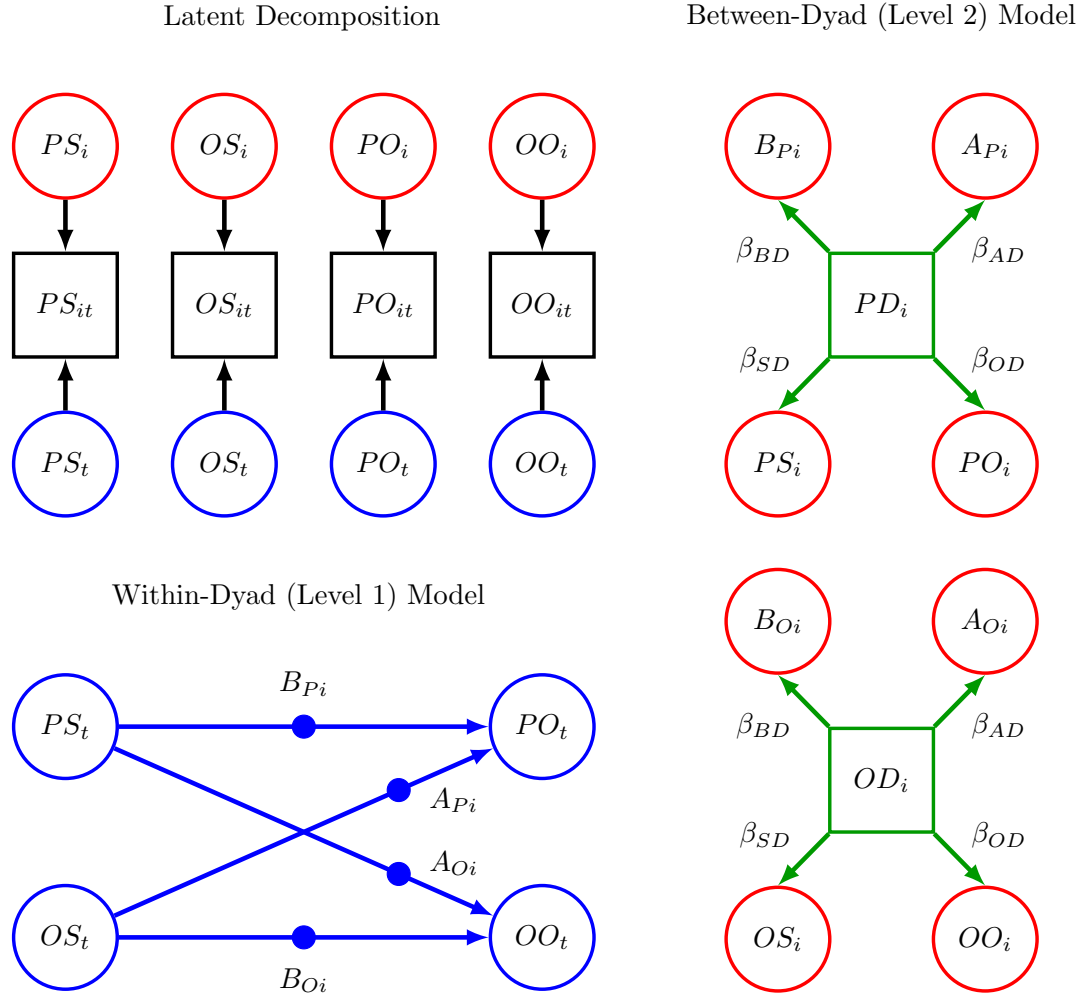


Figure 7: Multilevel truth-and-bias model for yoked interactions between romantic partners. The top-left panel depicts the latent decomposition of observed variables into within-dyad (t) and between-dyad (i) variance, the bottom-left panel depicts the within-dyad portion of the model, and the right panel depicts the between-dyad portion of the model. Filled dots represent random slopes on within-dyad regression paths and are labelled using truth-and-bias model convention (i.e., B and A). In this figure, PS = partners' self-perception of their own behavior, OS = outpatients' self-perception of their own behavior, PO = partners' other-perception of outpatients' behavior, OO = outpatients' other-perception of partners' behavior, PD = partners' depression status, and OD = outpatients' depression status.

In Model 2, which examined perceptions of interpersonal dominance, there were two significant random slopes for the within-person regression pathways. Specifically, there was a positive association between other-perceptions and negative affect ($p = .027$) and a negative association between other-perceptions and self-perceptions ($p = .014$). The indirect effect was not significant on either level of this model, suggesting that negative affect did not mediate the association between other-perceptions and self-perceptions of dominance. Finally, participants' depression status was again associated with a significantly higher intercept for negative affect ($p = .005$).

3.2.2 Interactions Between Outpatients and Romantic Partners

Table 5 shows the results from the multilevel truth-and-bias models of interactions between outpatients and their romantic partners. Models were run in two ways: once with the corresponding moderation-by-depression pathways constrained to equality between outpatients and romantic partners (e.g., so that the effect of depression on bias was the same for both outpatients and romantic partners) and again with these pathways freed to vary between outpatients and romantic partners. In both models of affiliation and dominance, the constrained models had better model fit as indicated by the Bayesian Information Criterion (BIC). Specifically, the improvement in BIC was 21.91 for the affiliation model and 24.29 for the dominance model. As BIC differences of 10 or greater are often interpreted as “very strong” evidence of model improvement [105], the constrained models were retained.

In Model 1, which examined perceptions of interpersonal affiliation, the random slopes for both outpatients' and partners' bias and accuracy pathways were positive and significant (all $p < .001$ except outpatients' accuracy, which was $p = .035$). Thus, a participant's other-perceptions were influenced by both their partners' self-perceptions (i.e., accuracy) and their own self-perceptions (i.e., bias). In this model, depression status did not significantly moderate intercepts or random slopes. In Model 2, which examined perceptions of interpersonal dominance, none of the random slopes for outpatients' and partners' bias and accuracy pathways were significant. Thus, in general, a participant's other-perceptions were not highly influenced by their partners' self-perceptions or by their own self-perceptions.

However, depression status did significantly moderate the random slope for bias ($p = .014$) such that depressed participants tended to have a more negative association between their self-perceptions and other-perceptions of dominance. Depression was also non-significantly associated with a lower intercept for self-perceptions of dominance ($p = .058$).

3.3 DISCUSSION

3.3.1 Interactions between Participants and Non-Romantic Partners

Hypothesis 2-1 was that participants' self-perceptions would be associated with their other-perceptions. The results supported this hypothesis in that, within a given situation, participants' other-perceptions and self-perceptions were positively associated for affiliation and negatively associated for dominance. Thus, consistent with the principle of interpersonal complementarity [74], interpersonal perceptions tended to match on affiliation (i.e., with both being friendly or both being separate) and mismatch on dominance (i.e., with one being dominant and the other being submissive). On the between-person level, this pattern was also present of affiliation, such that participants who viewed their partners as being more (or less) affiliative in general also tended to view themselves as being more (or less) affiliative in general. However, a significant association for dominance was not observed on the between-person level, which suggests that participants were more dominant in some interactions and more submissive in others.

Hypothesis 2-2 was that participants' negative affect would mediate the association between self-perceptions and other-perceptions. This hypothesis was partially supported by the results. There was evidence that negative affect *partially* mediated the within-person association between other-perceptions and self-perceptions in the affiliation model. That is, perceiving a partner's behavior as more (or less) affiliative was associated with a decrease (or increase) in negative affect, which in turn was associated with an increase (or decrease) in one's own affiliation. This is considered partial mediation because the direct effect of other-perceptions on self-perceptions was still significant when the negative affect pathways

were included. Thus, participants tended to behave in a separate manner during interactions in which they perceived their partners to be behaving in a separate manner; furthermore, participants found such interactions to be unpleasant and the degree of this unpleasantness was also associated with how separate participants were. While the finding of matching on affiliation is consistent with the principle of interpersonal complementarity, the idea that participants found interactions in which both parties were non-affiliative to be unpleasant runs contrary to the theory that people find complementary interactions pleasant and non-complementary interactions unpleasant [74]. These findings may suggest that this theory may not apply to individuals similar to the current sample (e.g., those with higher levels of general and personality pathology). Alternatively, there may be a hidden effect of interaction duration here. Interactions in which both parties are non-affiliative typically end quickly (and perhaps painlessly); however, external factors may require such interactions to continue past comfort, leading to negative affect. Follow-up work could explore this possibility.

In contrast, there was no evidence that negative affect mediated the within-person association between other-perceptions and self-perceptions of dominance. Perceiving a partner's behavior as more (or less) dominant was associated with increased (or decreased) negative affect, but the amount of negative affect experienced was not associated with one's own dominance in the interaction. Thus, although there was a direct effect of other-perceptions on self-perceptions of dominance, there was not a significant indirect effect through negative affect (on either the within-person or between-person levels). This pattern of findings, when combined with those from the affiliation model, suggests that participants found others' separation and, to a lesser degree, dominance to be unpleasant. Negative affect, in turn, was primarily associated with separation.

Hypothesis 2-3 was that depression would be associated with greater submission and negative affect overall as well as stronger mediation pathways. The first part of this hypothesis was partially supported by the results in that (in both models) depression was associated with higher levels of self-reported negative affect. Given that negative affect is one of the defining features of depression, this finding supports the validity of the EMA procedure. However, there was not evidence that depressed participants perceived their partners or themselves as more or less affiliative or dominant in general than did non-depressed participants. Depres-

sion also did not significantly moderate any of the random slopes on within-person regression pathways. Thus, contrary to theories that depressed individuals are more sensitive to interpersonal rejection and more likely to socially withdraw, they were not any more likely to respond to perceived separation with negative affect and did not view themselves as less affiliative overall. Similarly, contrary to theories that depressed individuals are more sensitive to others' dominance and more likely to submit or yield, they were not more likely to respond to perceived dominance with negative affect and did not view themselves as more submissive overall. One possible explanation for this pattern of findings is that sensitivity to rejection and dominance may be a more general feature of psychopathology and not specific to depression. It is possible that the hypothesized effects would have emerged in a sample comparing depressed participants to non-depressed members of the community without high levels of personality pathology. Future work will be necessary to explore this possibility.

3.3.2 Interactions between Outpatients and Romantic Partners

Hypothesis 2-4 was that depression would be associated with greater bias in interpersonal perceptions. This hypothesis was not supported by the results for affiliation but was supported by the results for dominance. These findings will be discussed in turn.

The results from analyses of interactions between outpatients and their romantic partners suggest that participants' other-perceptions of affiliation were influenced by both the "truth" (i.e., the other's self-perception) and "bias" (i.e., the participant's own self-perception). That accuracy effects were positive and significant for both outpatients and partners suggests that participants agreed (to a certain extent) on how affiliative each person was during a given interaction. That the bias effects were also positive and significant for both outpatients and partners suggests that participants tended to perceive others' behavior as similar in affiliation to their own behavior. Intriguingly, the influence of such bias effects may contribute to the development and maintenance of affiliative complementarity in general, and to the development and maintenance of social withdrawal in particular. For example, an individual in a psychological state that promotes separation may erroneously interpret others' behavior as separate and non-affiliative as well, making it less likely for them to connect with others

and receive social support. Indeed, the magnitudes of the bias effects in this analysis were larger than the accuracy effects. However, there was not evidence that a diagnosis of major depression moderated the bias or accuracy effects, or the perceptual intercepts, for affiliation. Thus, depressed participants were similar in these regards to the rest of the sample, and there was not strong support for the hypothesis that depressed individuals are more likely to focus on and erroneously perceive non-affiliative social messages (e.g., rejection, threat, or loss).

In contrast, there was not strong evidence to suggest that participants' other-perceptions of dominance were consistently influenced by the "truth" or "bias." The lack of a significant truth effect suggests that participants struggled to accurately interpret the other person's dominance and were influenced by factors other than that person's self-perception. The lack of a significant bias effect suggests that participants' perceptions of their own dominance was not consistently such a factor. However, the bias effect was significantly moderated by depression status. That is, depressed participants tended to interpret the other person's behavior as more (or less) dominant during interactions in which they viewed their own behavior as more (or less) submissive. Thus, depressed participants were more likely to report interactions with dominance complementarity, in which one person was dominant and the other was submissive, although their partner didn't necessarily agree about their own behavior. Depressed participants also perceived themselves as slightly more submissive overall, although this effect was not statistically significant. Taken together, these results may suggest that depressed participants were more likely to find themselves in interactions with their romantic partner during which they perceived their own behavior as more submissive and their partner's behavior as more dominant. These findings support the hypothesis that depressed individuals are more sensitive to other people's dominance and are biased in interpreting others' behavior as more complementary to their own than it really is. Thus, a depressed individual might be more likely to behave submissively and also to perceive dominance in their interaction partners, potentially leading to a positive feedback loop.

Table 4: Unstandardized Results from Moderated Mediation Models

	Model 1 (Affiliation)		Model 2 (Dominance)	
	Estimate	<i>p</i> -value	Estimate	<i>p</i> -value
Intercepts				
Other-Perception (O_i)	0.429	<.001	0.189	<.001
Negative Affect (N_i)	0.183	.007	0.158	.011
Self-Perception (S_i)	-0.005	.509	0.044	<.001
Random Slopes				
Other \rightarrow NA (a_i)	-0.152	<.001	0.083	.027
NA \rightarrow Self (b_i)	-0.031	<.001	-0.004	.675
Other \rightarrow Self (c_i)	0.045	<.001	-0.017	.014
Between-Person Regressions				
Other \rightarrow NA (β_{NO})	0.159	.303	0.054	.814
NA \rightarrow Self (β_{SN})	0.014	.626	-0.079	.145
Other \rightarrow Self (β_{SO})	0.134	.009	0.114	.172
Indirect Effects (Mediation)				
Within-Person	0.006	<.001	0.001	.681
Between-Person	0.000	.967	-0.011	.564
Moderation by Depression				
Other-Perception (β_{OD})	-0.015	.642	0.016	.563
Negative Affect (β_{ND})	0.198	.001	0.158	.005
Self-Perception (β_{SD})	0.001	.936	0.012	.557
Other \rightarrow NA (β_{aD})	-0.050	.278	0.036	.490
NA \rightarrow Self (β_{bD})	-0.002	.864	-0.018	.260
Other \rightarrow Self (β_{cD})	0.012	.119	0.010	.425

Note. Within-Person $N = 4804$; Between-Person $N = 199$. NA = Negative affect. All interactions were between participants and non-romantic partners. Perceptions are about affiliation in Model 1 and about dominance in Model 2. Parameter names refer to labels from [Figure 6](#).

Table 5: Unstandardized Results from Truth and Bias Models

	Model 1 (Affiliation)		Model 2 (Dominance)	
	Estimate	<i>p</i> -value	Estimate	<i>p</i> -value
Intercepts				
Partner Self-Perc. (PS_i)	0.038	.012	−0.004	.779
Outpatient Self-Perc. (OS_i)	0.002	.923	0.072	.002
Partner Other-Perc. (PO_i)	−0.002	.948	−0.012	.608
Outpatient Other-Perc. (OO_i)	0.023	.416	−0.018	.522
Random Slopes				
Partner Bias (B_{Pi})	0.599	<.001	−0.061	.245
Outpatient Bias (B_{Oi})	0.614	<.001	0.127	.063
Partner Accuracy (A_{Pi})	0.281	<.001	0.048	.280
Outpatient Accuracy (A_{Oi})	0.153	.035	0.017	.800
Moderation by Depression				
Self-Perception (β_{SD})	−0.035	.215	−0.051	.058
Other-Perception (β_{OD})	−0.017	.648	−0.007	.866
Bias Random Slope (β_{BD})	−0.160	.083	−0.225	.014
Accuracy Random Slope (β_{AD})	0.012	.889	0.012	.898

Note. Within-Dyad $N = 960$; Between-Dyad $N = 87$. All interactions were between outpatients and their romantic partners, and perceptions were provided by both interactants. Perceptions are about affiliation in Model 1 and about dominance in Model 2. All perception variables were centered by subtracting the mean of all self-perceptions. Corresponding moderation-by-depression pathways were constrained to equality for outpatients and partners. Parameter names refer to labels from [Figure 7](#).

4.0 STUDY 3: WITHIN-SITUATION

Study 3 examined the extent to which depression was associated with interpersonal functioning using a within-situation, observational measure of interpersonal behavior. The ability to analyze the momentary ebb and flow of behavior between interactants is unique to the within-situation approach, as is the ability to view interpersonal behavior through the lens of trained observers' perceptions. This study explored several specific questions. First, are interactants' behaviors systematically related on a moment-to-moment basis in terms of dominance and affiliation? Second, does depression influence participants' interpersonal behavior overall (i.e., across the entire interaction)? Finally, does depression moderate (e.g., potentiate or attenuate) the momentary linkages between interactants' behavior? On the basis of theory and previous research, these questions can be concretized into specific hypotheses.

- **Hypothesis 3-1:** Momentary ratings of outpatients' interpersonal behavior will be associated with corresponding ratings of romantic partners' interpersonal behavior. Specifically, associations will be positive between interactants' affiliation and negative between interactants' dominance. Analyses of cross-dimensional associations (e.g., between one interactant's dominance and the other's affiliation) are exploratory.
- **Hypothesis 3-2:** Depression will be associated with lower dominance intercepts (i.e., submission). Given the presence of theories predicting both higher and lower communion in depression, analyses of the affiliation intercepts are treated as exploratory.
- **Hypothesis 3-3:** Depression will be associated with stronger (i.e., potentiated) momentary linkages between interactants' dominance and between interactants' affiliation. Analyses of depression and cross-dimensional linkages are exploratory.

4.1 METHODS

4.1.1 Participants

The data examined in Study 3 were drawn from the same parent study as Study 2. This data consisted of 148 participants (i.e., 74 couples). The majority of these couples were in cohabiting relationships (70%) and the average relationship length was 59.3 months ($SD = 54.3$). The majority of couples (84%) were in an opposite-sex relationship, while the rest were in a same-sex relationship. Outpatient probands were predominantly female ($n = 58$, 78%) and romantic partners were predominantly male ($n = 48$, 65%). Outpatients were, on average, 30.6 years old ($SD = 6.0$) and romantic partners were, on average, 31.8 years old ($SD = 8.3$). The majority of participants were White (75%) or Black (15%) and the remainder were Asian American (2%) or more than one race (8%). Approximately half (49%) of participants reported an annual household income of less than \$25,000.

Thirty-four outpatients (46%) met the diagnostic threshold for major depressive disorder. Forty-five participants (61%) met the diagnostic threshold for an anxiety disorder, with the most frequent diagnoses being social phobia ($n = 10$), generalized anxiety disorder ($n = 9$), and anxiety disorder not otherwise specified ($n = 12$). An anxiety disorder was the primary diagnosis for a minority of these outpatients ($n = 13$). Forty-nine outpatients (66%) met the diagnostic threshold for one or more personality disorders ($M = 1.15$, $Mdn = 1$, $range = 0 - 5$), with the most frequent diagnoses being the borderline ($n = 21$), obsessive-compulsive ($n = 18$), antisocial ($n = 16$), and avoidant ($n = 13$) personality disorders.

Eight romantic partners (11%) met the diagnostic threshold for major depressive disorder. Twelve partners (16%) met the diagnostic threshold for an anxiety disorder, with the most frequent diagnoses being generalized anxiety disorder ($n = 4$), social phobia ($n = 3$), and anxiety disorder not otherwise specified ($n = 4$). Thirty-one romantic partners (42%) also met diagnostic threshold for one or more personality disorders ($M = 0.55$, $Mdn = 0$, $range = 0 - 3$), with the most frequent diagnoses being the obsessive-compulsive ($n = 13$), avoidant ($n = 7$), and antisocial ($n = 6$) personality disorders.

4.1.2 Procedures

Couples engaged in a conflict discussion that was video-recorded and later measured using an observational approach. Clinical interviewers facilitated the conflict discussions by first asking couples to fill out an “Areas of Disagreement” form. Couple members individually rated their relationship for problem areas (e.g., sex, childcare, household chores, and finances). The clinical interviewer then used the forms to identify suitable topics for the discussion. To facilitate the discussion, each couple member was asked to share their views regarding each discussion topic while his or her partner was instructed not to respond. Interviewers helped each couple member identify thoughts, feelings, and goals related to each issue. Couples were then instructed to talk for 10 minutes about these topics, during which time the interviewer exited the room. After the discussion, the interviewer facilitated de-escalation by normalizing the discussion and allowing each couple member to share their feelings.

4.1.3 Measures

4.1.3.1 Continuous Assessment of Interpersonal Dynamics (CAID) Both participants’ behavior during the conflict discussion was measured using the CAID [112] approach. Trained observers provided dimensional ratings of a participant’s interpersonal dominance and affiliation in real-time while watching a video recording of their behavior. Using custom software [52], observers manipulated a computer joystick to indicate changes in their ratings. The software provided visual feedback on the joystick’s position in the IPC at all times; it also recorded synchronized measurements of the joystick’s position at a rate of 2 Hz (twice per second). Observers were instructed to move the joystick in a relatively continuous manner in accordance with the target person’s statements and nonverbal behavior.

Six undergraduate research assistants trained in CAID rated each participant in each video. Videos included images and audio from both participants in a couple through a split-screen effect. Videos were viewed three times: once without rating (to gain an appreciation of the behavior’s broader context) and then again to rate each participant separately. Videos were presented in blocked randomized order to prevent ordering effects.

The reliabilities of each rated time-series, of which there were four per video (i.e., two

Table 6: Descriptive Statistics of Observational Measurements

Statistic	Outpatient		Partner	
	Dominance	Affiliation	Dominance	Affiliation
Mean	1.66	1.15	9.11	1.44
SD	20.94	19.67	20.44	21.42
Minimum	-62.69	-77.26	-62.39	-82.42
Maximum	64.40	59.67	78.35	92.15
Skew	-0.28	-0.61	-0.39	-0.66
Kurtosis	-0.42	0.14	-0.04	0.70

interpersonal dimensions each for two participants), were calculated using average score, two-way mixed-effects intraclass correlations [85] and reviewed in weekly observer meetings. As argued by Girard and Cohn [51], such meetings can combat observer “drift” (i.e., error due to fatigue, forgetting, or the accumulation of bad habits) by analyzing and standardizing the criteria that observers use to assign measurements to items. A small number of videos ($\sim 5\%$) were re-rated because of very low reliability. We also adopted an a priori rule to drop the one observer with the lowest agreement for each time-series (calculated using a leave-one-out procedure); the ratings from the remaining five observers were then averaged on a moment-by-moment basis. Thus, final time-series were a composite contributed to by five observers. Descriptive statistics for the CAID ratings are presented in Table 6. Average inter-rater reliability was excellent for dominance (agreement = .79, consistency = .86) and good for affiliation (agreement = .62, consistency = .75).

4.1.4 Data Analysis

The MSEM framework was used to test hypotheses on the within-situation tier; however, on this tier, the within-dyad level contained momentary observations instead of situational assessments. MSEM was used to decompose observed variables (i.e., observational ratings of affiliation and dominance) into within-dyad and between-dyad variance. The within-dyad portion of the model regressed outpatient dominance and affiliation at each moment on partner dominance and affiliation at that same moment. There were thus four within-dyad

regression paths: from partner affiliation to outpatient affiliation, from partner dominance to outpatient affiliation, from partner affiliation to outpatient dominance, and from partner dominance to outpatient dominance. Each of these regression paths was allowed to vary across dyads, thus creating random slopes. The between-dyad portion of the model regressed each interactant's affiliation and dominance intercept on their depression status. Both interactants' depression statuses also predicted the four random slopes. [Figure 8](#) depicts the proposed model. For clarity, covariances between variables were omitted from the figure.

4.2 RESULTS

[Table 7](#) shows the results from the model of interpersonal influence during conflict discussions. In this model, there were three significant random slopes for within-dyad regression pathways. There was a positive association between outpatients' and partners' affiliation ratings, controlling for partners' dominance ratings, and a negative association between outpatients' and partners' dominance ratings, controlling for partners' affiliation ratings (both $p < .001$). There was also a negative association between partners' affiliation ratings and outpatients' dominance ratings, controlling for partner's dominance ratings ($p = .027$). Several random slopes were significantly moderated by partners' depression status. Specifically, the association between partners' dominance ratings and outpatients' affiliation ratings was more negative for depressed partners ($p = .035$), and the association between partners' and outpatients' dominance ratings was less negative for depressed partners ($p = .003$). No random slopes were significantly moderated by outpatients' depression status. Finally, if partners were depressed, their affiliation intercept was significantly higher ($p = .007$), and if outpatients were depressed, their dominance intercept was non-significantly lower ($p = .051$).

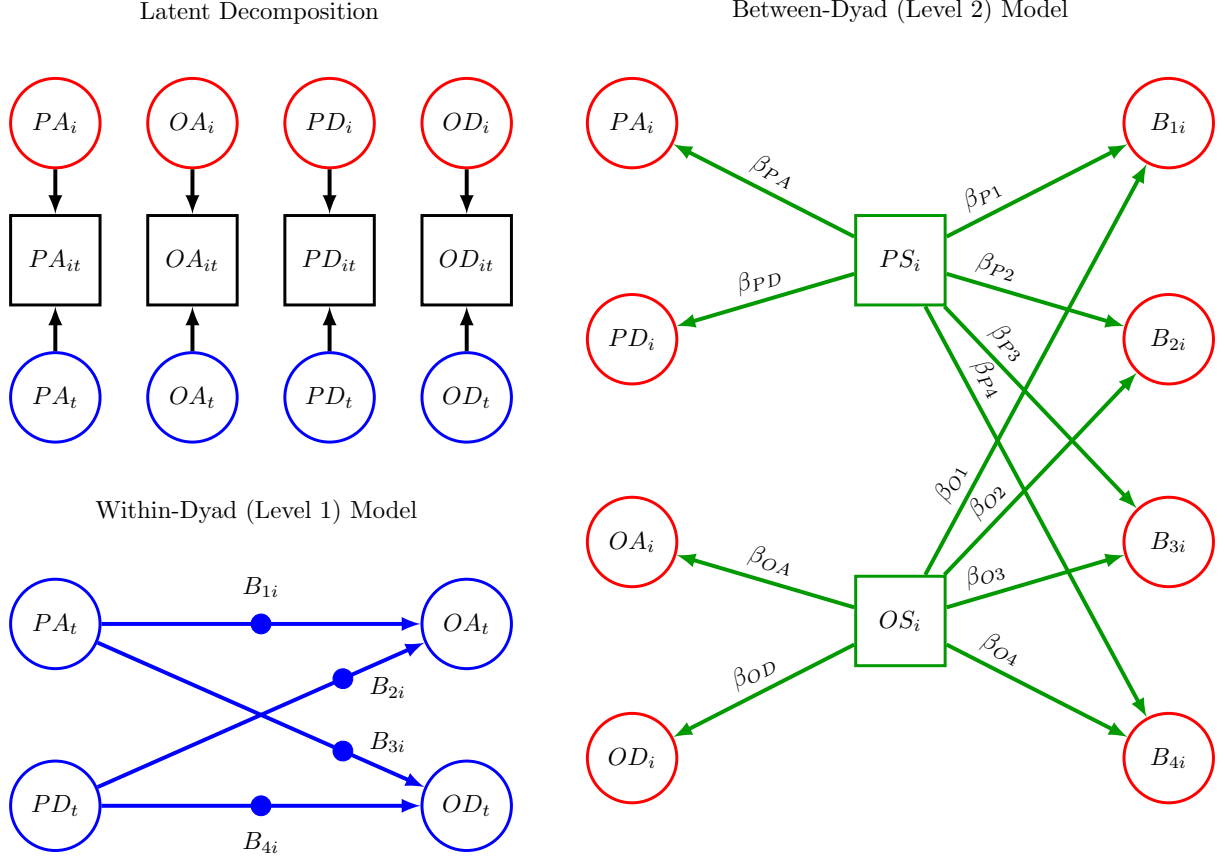


Figure 8: Multilevel Model for conflict discussions. The top-left panel depicts the latent decomposition of observed variables into within-dyad (t) and between-dyad (i) variance, the bottom-left panel depicts the within-dyad portion of the model, and the right panel depicts the between-dyad portion of the model. Filled dots represent random slopes on within-dyad regression paths. In this figure, PA = ratings of partners' affiliation, OA = ratings of outpatients' affiliation, PD = ratings of partners' dominance, OD = ratings of outpatients' dominance, PS = partners' depression status, and OS = outpatients' depression status.

4.3 DISCUSSION

Hypothesis 3-1 was that ratings of interactants' momentary interpersonal behavior would be associated with one another. The results strongly supported this hypothesis in that the associations for both affiliation and dominance were very significant and large in magnitude. Consistent with hypotheses, and the principle of interpersonal complementarity, the association for affiliation was positive and the association for dominance was negative. Thus, moment-to-moment, interactants tended to match on affiliation (i.e., with both being friendly or both being separate) and trade off on dominance (i.e., with one being dominant and other being submissive). The negative association between interactants' dominance ratings was particularly large in magnitude. In terms of cross-dimensional associations, there was also a significant, though smaller in magnitude, negative association between partner affiliation and outpatient dominance, such that partner affiliation tended to coincide with outpatient submission and partner separation tended to coincide with outpatient dominance. Thus, partner separation often coincided with outpatient disagreeableness (i.e., dominant separation) and partner affiliation often coincided with outpatient agreeableness (i.e., submissive affiliation). The current analyses did not explore lead-lag relationships and thus the direction of causality remains unclear (this will be an important area for future research to explore). However, consistent with previous research on the importance of beginning potentially-conflictual conversations with a "soft startup" (e.g., [54, 55]), these findings suggest that affiliative behavior had a great deal of influence and inertia during the romantic conflict discussions.

Hypothesis 3-2 was that depression would be associated with a decrease in dominance and either an increase or a decrease in affiliation. This hypothesis was only weakly supported by the results. Unexpectedly, the influence of depression on interpersonal behavior differed for outpatients and romantic partners. Depression in romantic partners was associated with a large increase in affiliation for romantic partners, whereas depression in outpatients was non-significantly associated with a decrease in dominance ($p = .051$). The former finding may suggest that partners were more likely to show forms of depression marked by submissive affiliation; the fact that a decrease in dominance was not observed in this group may be related to the context of a conflict discussion. The difference between groups

may be due to personality and psychopathology differences between the two groups, given that participants were assigned to the outpatient or partner groups based on the severity of their personality pathology. For example, the rate of borderline personality disorder was significantly higher among depressed outpatients than among depressed partners ($p = .044$ in a generalized linear model). However, it is important to note that relatively few partners (11%) were diagnosed with major depressive disorder. The findings pertaining to moderation by partners' depression status will thus need to be replicated in a larger sample.

Hypothesis 3-3 was that depression would be associated with stronger momentary linkages between interactants' dominance ratings and between interactants' affiliation ratings. This hypothesis was only partially supported by the results, as these effects also differed between outpatients and partners. Whereas outpatient depression status did not moderate the momentary linkages for affiliation or dominance, the dominance linkage was moderated by partner depression status. Thus, depressed partners' dominance was more likely to coincide with outpatient affiliation, and depressed partners' submissiveness was more likely to coincide with outpatient separation. Additionally, when partners were depressed, the association between partners' and outpatients' dominance ratings was less negative. Thus, depressed partners' submissiveness was less likely to coincide with outpatient dominance, and depressed partners' dominance was less likely to coincide with outpatient submissiveness. These findings indicate that submissiveness in depressed partners was more likely to coincide with outpatient introversion (i.e., submissive separation) and may provide clues to the function and context of these behaviors. For example, partners may have become submissive out of fear that outpatients' withdrawal signaled an impending attack or abandonment.

Taken together, these findings highlight the importance of the "interpersonal field" (i.e., the behavior of one's interaction partner) as a contextual influence on behavior. The depressed state, and perhaps the associated traits of neuroticism and introversion [79], appear to nudge behavior (perhaps towards affiliation or perhaps toward submissiveness), but the majority of the variability in behavior was explained by the shifting context of the interaction. These within-situation analyses are an important reminder that personality traits are *probabilistic* descriptions of relatively stable patterns that are inherently contextualized and require appropriate eliciting stimuli before they are manifested in behavior (e.g., [40]).

Table 7: Unstandardized Results from Multilevel Model for Conflict Discussions

	Estimate	SE	<i>p</i> -value
Intercepts			
Partner Affiliation (PA_i)	−0.091	2.181	.967
Outpatient Affiliation (OA_i)	0.041	2.438	.987
Partner Dominance (PD_i)	9.409	1.568	<.001
Outpatient Dominance (OD_i)	10.631	1.771	<.001
Random Slopes			
Affiliation → Affiliation (β_{1i})	0.297	0.036	<.001
Dominance → Affiliation (β_{2i})	0.018	0.037	.629
Affiliation → Dominance (β_{3i})	−0.132	0.060	.027
Dominance → Dominance (β_{4i})	−0.721	0.054	<.001
Moderation by Partner Depression			
Partner Affiliation (β_{PA})	14.147	5.233	.007
Partner Dominance (β_{PD})	−3.719	7.532	.622
Affiliation → Affiliation (β_{P1})	0.246	0.131	.061
Dominance → Affiliation (β_{P2})	−0.157	0.074	.035
Affiliation → Dominance (β_{P3})	0.095	0.143	.510
Dominance → Dominance (β_{P4})	0.276	0.092	.003
Moderation by Outpatient Depression			
Outpatient Affiliation (β_{OA})	1.153	3.280	.725
Outpatient Dominance (β_{OD})	−5.869	3.010	.051
Affiliation → Affiliation (β_{O1})	−0.026	0.063	.681
Dominance → Affiliation (β_{O2})	−0.009	0.059	.874
Affiliation → Dominance (β_{O3})	0.140	0.084	.095
Dominance → Dominance (β_{O4})	−0.021	0.076	.786

Note. Within-Dyad $N = 90258$; Between-Dyad $N = 74$. All random slopes regress ratings of outpatient behavior on ratings of partner behavior. Parameter names refer to labels from [Figure 8](#).

5.0 GENERAL DISCUSSION

To recap, there is substantial overlap in clinical theories of depression from a variety of theoretical orientations including psychodynamic, attachment, cognitive, evolutionary, and social neuroscience. When viewed through the lens of interpersonal theory, this overlap can be conceptualized as a negative association between depression and interpersonal agency such that the disorder tends to manifest as submissive affiliation (e.g., dependency, sociotropy, or attachment anxiety) or submissive separation (e.g., self-criticism, autonomy, or attachment avoidance). Empirical studies using dispositional measures of interpersonal functioning have supported the existence of this association in both clinical and community samples.

However, dispositional measures struggle to capture the nuanced influence of context on interpersonal behavior. As such, they do not reveal how consistently depressed individuals behave submissively, what situational factors push depressed individuals toward submissive affiliation versus submissive separation, or what the momentary mechanisms underlying these processes are. Unfortunately, studies using cross-situation or within-situation measures of interpersonal functioning, which could provide answers to these questions, have been rare. The current set of studies addresses this gap in the literature by examining depressed interpersonal behavior using dispositional, cross-situation, and within-situation measures.

Study 1, which examined dispositional self-reports of interpersonal problems, found strong support for the hypothesis that depression would be associated with a reduction in interpersonal agency. Furthermore, coherent subgroups of depressed participants were identified that fit the prototypes of submissive affiliation and submissive separation. Given that these two subgroups made up more than half of the depressed sample, these results can be interpreted as strong support for the existence of depressive subtypes distinguished on the basis of interpersonal communion. Interestingly, however, a large portion of the depressed

sample did not fit into one of these two subgroups and appeared, on average, to be slightly more dominant. Exploratory analyses suggest that these participants were more likely to have Cluster B (i.e., dramatic, erratic) personality traits as opposed to the more prototypical Cluster C (i.e., anxious, fearful) personality traits. These results suggest that depression can be associated with several distinct interpersonal styles based on the afflicted individual's personality configuration. The majority of depressed participants showed the expected negative association with interpersonal agency, while those with more Cluster B personality traits did not. Regardless of interpersonal style, depression was consistently associated with generalized interpersonal distress, which thus may be its defining interpersonal feature.

Study 2, which examined cross-situation self-reports of interpersonal behavior, did not find strong support for the hypothesis that depression would be associated with a reduction in interpersonal agency. Depressed participants did not report behaving any more submissively during interactions with romantic or non-romantic partners, although the effect was in the hypothesized direction for the former. These analyses did reveal important contextual influences, however, for participants generally and for depressed participants specifically.

During interactions with non-romantic partners, participants showed strong interpersonal complementarity in their interpersonal perceptions. That is, they tended to view both themselves and their partners as behaving similarly in terms of affiliation and oppositely in terms of dominance. Furthermore, this association was partially mediated through negative affect for affiliation such that negative affect was predicted by partner separation, and participant separation was predicted by both negative affect and partner separation. While these pathways were not significantly moderated by depression, depressed participants did report an overall increase in negative affect across such interactions. Thus, all participants found partner separation to be unpleasant and were less affiliative themselves when experiencing negative affect. The difference for depressed participants was not how strong these associations were but rather that they tended to experience more negative affect overall.

During interactions between outpatients and romantic partners, participants' perceptions of the others' affiliation were influenced by both the "truth" and by "bias" (i.e., by the others' self-perceptions and by their own self-perceptions, respectively). Thus, both interactants agreed about how affiliative or separate each person was being in the interaction,

but both were also biased in terms of perceiving self and other behavior as more similar on affiliation than they really were. These perceptual processes did not differ between depressed and non-depressed participants. However, a different story emerged for perceptions of dominance. In general, participants' perceptions of their partners' dominance were not consistently influenced by either the "truth" or by "bias." Thus, participants did not agree on how dominant or submissive each person was being in the interaction, and neither person's other-perceptions were consistently influenced by their own self-perceptions. However, depressed participants were significantly more biased than non-depressed participants. That is, they tended to perceive the other as behaving oppositely to themselves in terms of dominance, e.g., the more submissive they were, the more dominant the other appeared.

Study 3, which examined within-situation observations of interpersonal behavior between outpatients and romantic partners, did not find strong support for the hypothesis that depression would be associated with a reduction in interpersonal agency. Depressed outpatients were, on average, rated as more submissive than were non-depressed outpatients. However, this effect was not statistically significant and did not replicate for depressed partners. Rather, depressed partners were rated as significantly more affiliative on average than were non-depressed partners. The effect of depression on the momentary linkages between outpatients' and partners' behavior also differed for outpatients and partners. Whereas the outpatient depression did not moderate any of these associations, for depressed partners, the linkage between interactants' dominance was significantly less negative and the linkage between partner dominance and outpatient affiliation was slightly more negative. Thus, specifically for couples with a depressed partner, partner dominance (or submission) was less likely to coincide with outpatient submission (or dominance) and more likely to coincide with outpatient separation (or affiliation). This finding can be interpreted as depressed partners being more likely to modulate their dominance based on outpatients' behavior.

Taken together, the results of these three studies paint a nuanced picture of interpersonal behavior in depression. The hypothesized reduction in interpersonal agency was most supported by dispositional measures of interpersonal problems. Over half of the participants diagnosed with major depressive disorder fell into one of the two expected prototypes (i.e., submissive affiliation and submissive separation). However, even dispositional measures did

not paint a perfectly clear picture of depression. There was a third, more heterogeneous group of depressed participants that did not fit into one of these prototypes and seemed to capture depressions comorbid with Cluster B personality disorders. The size of this group was likely inflated by the sample's focus on personality pathology, but the fact remains that a nontrivial percentage of depressed participants reported being more dominant than submissive. Thus, clinical theories of depression (and practicing clinicians) need to carefully consider the pathoplastic influence of individuals' personality traits on their interpersonal functioning (and utilize assessment tools to inform their work). Especially in the context of personality pathology, which is not uncommon in many clinical settings, depression can be a quite interpersonally heterogeneous group.

Cross-situation and within-situation measures of interpersonal behavior provided only weak support for the hypothesized reduction in interpersonal agency. There was no evidence of such a reduction during interactions with non-romantic partners, and although there were effects in this direction for both cross-situation and within-situation measures of behavior between outpatients and romantic partners, they did not reach statistical significance. These effects would likely have been significant in a larger sample, but they are not large or consistent enough to inspire confidence that they would replicate in a different sample.

In contrast, the influence of contextual factors on interpersonal behavior was very strong for both the cross-situation and within-situation measures. During interactions with non-romantic partners, participants' negative affect played a key role in explaining their interpersonal perceptions of self and other. That this variable was significantly increased in depression suggests that emotion must be considered if depressed interpersonal behavior is to be fully understood. During interactions with romantic partners, as assessed by cross-situation measures, participants' interpersonal perceptions of others' behavior were also systematically biased by their own self-perceptions. Participants in general were biased to perceive others as similar to themselves in terms of affiliation, and depressed participants in particular were biased to perceive others as opposite to themselves in terms of dominance. Finally, across all interactions and measures, participants were strongly influenced by the context of their interaction partner's behavior. Specifically, participants tended to match with their partners in terms of affiliation and mismatch with their partners in terms of dominance. These

results are strong support for the principle of interpersonal complementarity and reveal that the “interpersonal field” created between interactants is a critical factor in understanding individuals’ instantiated behavior. These associations were not significantly moderated by depression using cross-situation measures. However, couples with depressed partners (but not couples with depressed outpatients) had a significantly weaker mismatch on dominance than did couples without depressed partners. There are likely other important contextual factors as well that were not included in these analyses. Future work would benefit from examining more types of interaction partners, conversation topics, relationship quality, etc.

Although the current set of studies is likely the most comprehensive examination of depressed interpersonal behavior to date, there were several limitations of the samples and methodologies that bear mentioning. The first few are inherent to the data and are not directly addressable, whereas the last few will be addressed in follow-up work.

First, the sample’s focus on personality disorders limits the studies’ generalizability to settings with lower rates and severity of psychopathology. Second, the first study included participants that were assigned psychiatric diagnoses using a mixture of methods, which may have introduced some unintentional variability. Whereas most participants were diagnosed using the LEAD standard and DSM-IV criteria, one subset (used in all three studies) was diagnosed using a single clinical interview and another, different subset (only used in Study 1) was diagnosed using DSM-III-R criteria. Third, whereas the cross-situation measure of participants’ own behavior was quite rich (including 16 items each time), the corresponding measure of partner behavior was sparse in comparison (including only 7 items).

Fourth, in all three studies, depression was operationalized using a dichotomous diagnosis variable. However, the true construct of interest in these studies is the dimensional variable underlying this dichotomization. Follow-up work will examine these questions using a dimensional measure of depression. Fifth, the cross-situation measurements included a great deal of missing data, which Study 2 did not address explicitly. Follow-up work will examine and account for this missingness using multiple imputation or maximum likelihood. Finally, analyses of the within-situation measurements of interpersonal behavior did not consider different lags between participants or autocorrelated residuals. Follow-up work will address these issues using the newly released dynamic structural equation modeling [10].

In conclusion, although clinical theories of depression converge in suggesting that it is associated with a reduction in interpersonal agency, a multi-tiered analysis of interpersonal behavior (including dispositional, cross-situation, and within-situation approaches) reveals a more nuanced picture. Most depressed participants in the current sample reported interpersonal styles characterized by submission. However, a nontrivial proportion of depressed participants (i.e., those with more Cluster B personality traits) reported interpersonal styles characterized by dominance. Differences between depressed and non-depressed participants were also subtle when cross-situation and within-situation measures were used. Depression was associated with more negative affect and more bias regarding romantic partners' dominance. However, significant effects of depression on participants' overall dominance and affiliation were not found. Much stronger and more consistent were contextual influences. Participants tended to match with their interaction partners on affiliation and mismatch on dominance. They found partner's non-affiliative behavior to be unpleasant and tended to respond to negative affect with their own non-affiliation. Thus, depressed participants were subject to most of the same interpersonal processes as the rest of the sample and differed only subtly in terms of perceptions and reactivity. These results underscore the importance of understanding depressed behavior within its broader interpersonal and affective contexts.

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